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BRIEF SKETCH of the A.C.A. SHOW

THE eighth annual show of the Automobile Club of America in the Grand Central palace, New York city, is in progress now, and the indications point to it being a successful exhibition of cars and accessories. The money panic in the east undoubtedly will have some effect upon it, but the promoters feel it will be slight, for high-priced cars such as the financial world is interested in do not predominate at this show.

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Prevailing prices revolve around \$2,500 for a touring car and \$1,500 for a medium grade vehicle. Surprising values are reported in the \$1,000 models, while the tendency seems to be to meet the demand of the public for lower-priced goods as much as possible. Makers of cars and accessories say they have done their part—now it is up to the manufacturers of tires to help as much as possible.

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Sixteen different makes of six-cylinder cars are shown, some of the makers declaring they are turning out this type because the public demands it, not because they favor the idea themselves. Dealers, though, seem enthusiastic over the proposition.

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An early count shows there are 277 exhibits in the building, of which sixty-eight have complete vehicles, six commercial rigs, six are showing motor buggies, two electric vehicles and two motor cycles.

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Fewer supply houses are found in the accessory department, there being more displays by individual makers of parts and sundries. Speedometer, shock absorber and electrical apparatus displays are more numerous than ever. Fewer commercial rigs are shown.

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A feature of the show is the front put up by the makers of motor buggies. Where a year ago the Holsman was the only one of this type exhibited, now there is a comprehensive exhibit made up of half a dozen of

this high-wheeler. Freaks are prominent through their comparative absence.

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Criticism is made of the failure of the members of the Automobile Club of America, promoting the show, to support the organization by attending the private exhibition on the opening day.

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Featured among the pleasure cars are a dozen newcomers, some of them being the product of those who have just entered the industry.

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Members of the A. L. A. M. take an interest in the show, but do not try to steal any of the thunder by the use of printer's ink. They seem content to rest on their oars and wait for the opening of their own show Saturday night.

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Few of the makers have endeavored to increase the power of their motors. The public seems satisfied, and so the designers have not tried to secure more speed, and when there is any increase it is not much above 5 horsepower.

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Two big concerns, the Rambler and Berliet, are not in the show because of inability to secure the space they desired, so they have independent exhibitions which are being held in their respective New York sales rooms.

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The attendance of out-of-town dealers was slim at the beginning of the week, it being believed that most of them were waiting so they could take in both of the shows. The regular attendance the first few days was smaller than last year, probably due to the fact that the promoters are charging the exhibitors twice as much for the tickets which the trade distributes to the prospective customers they have in tow. The money panic, too, must be taken into consideration when making excuses for the falling off in the attendance at this independent exhibition.



NEW YORK, Oct. 24—To the accompaniment of a Wall street panic, failing banks and tottering trust companies, the motor car show of the Automobile Club of America, backed by the American Motor Car Manufacturers' Association, opened at the Grand Central palace last night with as much of a hurrah as if stocks were above par, banks were Gibaltars and there was no thought of what the financial morrow might bring forth. There were the same big opening night crowding of aisles and over-running of booths. Whatever argument there may be among makers and dealers as to the advisability of early shows there was no mistaking the fact that the general public either likes autumn show giving or is still so filled with motor car enthusiasm as to be eager to look over the machines at any old season of the year. It is very certain that the people did not all come in mere idle curiosity, following only an impulse to go where the crowd went. The close examination of the cars, the interested questions put to the showmen, and the fact that there were as many crowding around the accessory stands as swarmed around the motor car booths tells a significant tale of continued general public interest in the motor car.

As usual there was a preliminary view given the members and their guests in the afternoon. Here there was a contrast to be noted to last year. The long lists of heavy swell "among those present" given out by the club's society press agent to the contrary notwithstanding, there was not near as big a first afternoon crowd as last year, nor was the line of carriages and cars in front so long, nor were there so many of the familiar faces of motoring enthusiasts seen in the aisles.

Was the absence of the foreigners and a big layout of high-priced cars responsible for this or did the high society contingent have troubles of its own to look after down town in Wall street? There are some who say that most of the members are willing to let Sam Butler run the show for what there is in it for the club's sinking fund without any feeling of obligation to support the enterprise by their presence or their purchases. There also

are some to ask how long the American Motor Car Manufacturers' Association will continue to find it the better business policy to be the tail of the club's kite.

Although the Motor Age staff has not at this writing completed its census of the show it will not probably be far out of the way to put the total number of exhibitors at 277, of which sixty-eight are showing complete vehicles. Six concerns are showing business wagons; six motor buggies; two electric vehicles, and two motor cycles.

The accessories end of the show is noteworthy in the far fewer supply houses exhibiting. There are more displays than before of individual sundries and parts. There is a very marked increase in the number of speedometers, shock-absorbers and electrical apparatus displayed. The tire contingent is more conspicuously large than ever. Formerly lots of novelties were on view in the accessory section. This time there are few, the displays in the main being made up of standard supplies. Exhibitors of motors are not numerous. There are fewer exhibitors of commercial vehicles than last year. Mitchell and Frayer-Miller are to be noted among the absentees. Their places, however, are



A HORSE ON THE RAINIER



taken by Rapid, Atlas, Logan, Mack and Reliance. Logan shows improvements and Reliance advancement with two, three and four-cylinder motors.

In the motor cycle division one sees a large number of tri-cars and notices a development in the direction of multi-cylinder construction. Curtiss even shows an eight-cylinder. So much for the chief division of the vehicle types.

Disk clutches are increasing. Makers are reducing the number of disks and all are placing them in oil. Selective transmission is seen everywhere in the big cars. Ball bearings are generally in gear sets and are coming in engines. Shaft drive predominates. In fact there are only two chain-driving cars in the show among the big cars—the Chadwick and Ellsworth. In the matter of ignition jump spark is increasing. Double systems prevail with the current taken from magneto and storage batteries and with double sets of spark plugs. There is make-and-break in three or four cars, including Garford, Gaeth and Rainier. There are three noteworthy improvements in frames. Some frames are dropped from 3 to 4 inches in front of the back axle. Others arch the frame over the back axle while others drop the frame between the axles. Sub frames are gradually

becoming obsolete. Armored wood frames are only used in three cars—the Mora, Lambert and Reliable-Dayton. Straight line bodies are the universal rule in this big exhibition.

All tools are now placed on the running board instead of beneath the seat. Wheels are growing in size and springs are longer, wider and heavier. As to axles it is a case now of I-beam front and floating rear. Double internal and external brakes are placed in the rear wheels and none on the transmission shaft.

In the accessory department little initiative is in evidence. Sundry makers are following one another like a flock of sheep, producing new speedometers, shock absorbers and other standard supplies without attempting to invent something new to meet many other needs of motorists. The failure to have a Vanderbilt cup race this year has brought ten makers to a standstill in the invention and improvement of removable rims, even though the tourist needs them as much as the racer. There is noteworthy activity, however, in carbureters. There is a strange absence of taximeter instruments in view of present conditions, only one being recalled. No effort is being made in the production of alcohol motors. The Standard Oil Co.'s gradual reductions in the price of gasoline with a view to heading off the alcohol people seems to have been effective.

Though there was no attempt at elaborate decoration, which would have been well nigh impossible in such an ill-suited building for a display of artistic embellishment the interior presented an unpretentious but rather pretty picture the opening night. An autumnal out-of-door effect was arrived at and quite well attained. The galleries were hung with leaves and the walls and pillars were draped in green. At one end of the rotunda blazed the familiar electric-lighted emblem of the club, which in smaller sizes was pinned in the draperies overhead. The booths were carpeted in red and the signs were of white with gold-bordered brown letters. The whole scheme of rotunda decoration, however, underwent an enforced change this afternoon, for the fire department ordered out the dry leaves, which could easily be set aflame by a carelessly tossed match or cigar butt,



AGAIN THE HORSE COMES IN



STREET SCENE NEAR THE PALACE BUILDING

though there was every effort to enforce the rule against smoking. The campaign against smoking was strenuous, for the management had been notified by the fire department that unless it was stopped the show would be closed. Accordingly orders were given the attendants to eject any who refused to comply with the rule. By chance E. E. Schwartzkopf, publisher of *Automobile Topics*, and J. E. Braden, of the Diamond Rubber Co., were the victims. There was a merry row over it through some of their friends piling in for a rescue. Blows were exchanged.

The show is most conveniently segregated so that it is very easy to find one's way and what one is seeking. Motor cycles, motor buggies, motor wagons, and accessories are grouped. In a word, the palace show is a nice, simple, well arranged and well managed exhibition.

Many makers of the licensed group are to be seen in the aisles. There has been no attempt of the A. L. A. M. people to butt in at all on the clubs' show work either by press matter or an inordinate amount of legitimate garden exhibition advertising. Nor have licensed makers to any considerable extent advertised their cars in the dailies in opposition to the independent machines. The importers have been equally modest about proclaiming the merits of their own show and wares.

At least a dozen new makers of complete cars are exhibiting their product. Garford, Rainier and Cleveland, who are now practically newcomers putting out new cars, are at the show. Out and out newcomers, to enumerate them offhand, embrace Allen-Kingston, Overland, Klink, Continental, Gaeth, Gearless, the two-engine Carter, and Marion, the last named having returned to the car-building fold.

The show of cars as a whole presents a noteworthy uniformity



SUCCESS BUGGYABOUT IN NEW YORK

of class. A large majority of the exhibitors in their output appeal to the masses rather than to the classes. In a word the predominant merit of the independent layout is the remarkable value they have found possible to give for the money, and the cars, really marvelous in efficiency and appearance, that they have produced at figures within the reach of a man of moderate means. It is insisted by the leaders at the palace show, as by many of the licensed group, that a man who wants a good car can get it for \$2,750 and get as much for his money in real value as if he paid \$4,000, and that his car will have every good feature of the top-notchers in price. Below this, they say, you can drop step by step, dollar by dollar, through the different grades of cheaper construction. The prevailing prices at the palace revolve around \$2,500 for a good car and \$1,500 for one of medium grade. They run below that as far down as \$600 and \$500 runabouts. The \$1,000 cars are considered marvels in appearance and value. There is much talk at the show of price tendencies and the chances of the cheaper against the higher-priced cars in the trade of the future and in fact in the business struggle of the coming season. It is insisted that the makers of cars and accessories have successfully met the public demand for lower prices. It is pointed out that it cannot be denied that many owners are complaining of the cost of maintenance and invariably couple their complaint with a wail over the cost of tire replacement. The owners are not alone in their demand for lower prices for tires. More than one maker declared that it was now up to the tire makers to meet this obstacle to the purchase and continued use of cars by making them and all that goes with them cheaper. The show, be it remembered, is being run at a time when the financial horizon has dark clouds and the future of the business presents serious problems to all classes.



WHERE MARMONS ARE DISPLAYED

The six-cylinders, as was expected, are much in evidence. Sixteen makers exhibit them within the building and two show them on the outside. There are besides two six-cylinder motors on view, unmounted. The question of the probability of the six-cylinder demand lasting is much discussed. Out of town dealers are more enthusiastic over them than are the makers themselves. Several of the latter in fact frankly declare that they only make them to keep their customers from buying them elsewhere. Price considerations again enter into the consideration of the six-cylinder question. Those believing in the policy of aiming at motor cars lower in price and cheap of maintenance are asking why encourage the demand for cars more expensive to manufacture and why add further to the cost of tire maintenance by adding to the weight. That the six-cylinder demand is on with the public, however, there is no denying. As above noted, 25 per cent of the makers at the show are answering the demand.

The tourabout, which for the most part appears in convertible form for two, three or four passengers, is attracting much attention and seems likely to prove very popular the coming season. Besides considerations of economy in the resultant entertaining guests there is tire economy, so much in the motorist's mind now,

through saving in weight and doing away with the tire-wearing swaying of the heavy tonneau.

A noteworthy feature of the show is the first serious invasion of the east by the motor-buggies. Tourists have reported seeing many of them in New England and their makers look for headway even in New York; for in the west their use is not confined to farmers, many professional men driving them. These exhibitors are telling easterners that these motor-buggies have been invariably creditable survivors in the western endurance tests and calling their attention to the fact of their economy of maintenance attendant on their being fitted with solid tires.

The high-power craze seems to have pretty nearly reached its end or limit. But small increase is noted and then as a rule not over 5 horsepower where there has been any increase at all. In bicycle times there was in the early days a parallel craze for high gears, which later subsided.

The improvement in lubrication and ignition is noteworthy in the 1908 cars. Polished cabinet wood dashboards are now quite prevalent, the dash having been cleared to a great extent of incumbrances. Oilers have been placed under cover and grease cups added. As for ignition one now sees magnetos on cars as low priced as \$2,750. The advance of the two-cycle motor is seen notably in commercial vehicles, whose engine tendencies are toward simplicity. The Atlas and Reliance people have two, three and four-cylinder motors of this type on their business wagons. The advantage of the two-cycle simplicity doing away with over 150 parts of an engine means much, it is claimed, in view of the fact that horse drivers rather than chauffeurs must be relied on mainly to pilot these vehicles. There are practically no freaks in the show. "The mills of the gods grind slowly," you know. The motor industry has reached the point



PREMIER, ANOTHER HOOSIER

when changes of construction come slowly and then only after long test and mature consideration.

There are two noteworthy exhibits outside the show held, say their givers, because it was not possible to obtain adequate or satisfactory space. These will be continued during the show fortnight. The American Locomobile Automobile Co. is exhibiting the Berliet at the Waldorf-Astoria and Thomas B. Jeffery & Co. are showing the Rambler line at their local agency, the Homan & Schultz Co. Both say their liberal advertising has attracted a satisfactory attendance.

The Ford booth has only 1907 models on view. Secretary Couzens, who is on hand, says that there will be no public display or exploitation of the 1908 models before January.

So far the attendance of agents is not large. It is noteworthy that most of those here appear to be from the far west. The absence of dealers from near-by towns is explained by the fact that the two shows follow one another and take up more than 2 weeks. It is suggested that it is natural to assume that most of them have planned to arrive here on Tuesday or Wednesday and devote half a week to each show.

Following the big paper crowd of the opening night the attendance has seemed small. It is undoubtedly smaller than last

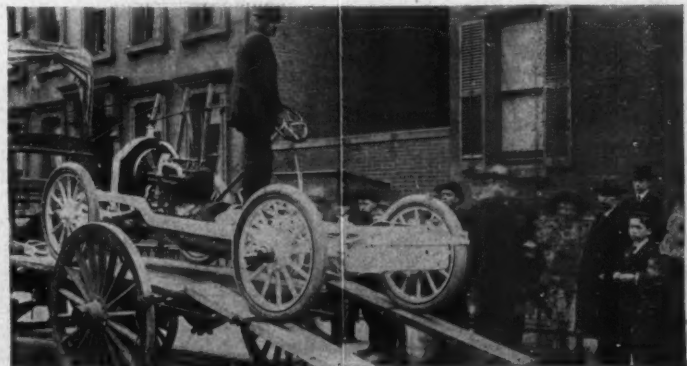


AWAITING A CHANCE TO GET IN

year, though the management says the gate receipts have fallen only about \$300 below those of last year. There are fewer complimentary tickets being sent out to customers this year owing probably to the price having been raised to 50 cents as against 25 cents at the last show. This is undoubtedly affecting the attendance. It must not be forgotten, however, that money panic conditions are prevailing now in this city and the people have troubles of their own. It is rather early for any verdict on the selling results of the show. There have been sales made.

While the business done the first day was slight because of the rubberneck tendencies displayed by the crowd which came because of the excitement that always attends an opening night, still the outlook for trade later in the week is most promising. The exhibitors are waiting until next week, when the out-of-town dealers are expected to flock in and place their orders. By not getting here early these people will be able to buy, then inspect the A. L. A. M. goods in order to pick up arguments to be used in the fight for business next spring. Retail trade ought to be good, too, for this magnificent display includes cars that appeal to the masses because of their prices. Not everyone has been hit by the Wall street excitement, the people of the middle classes as a rule having kept out of the whirlpool.

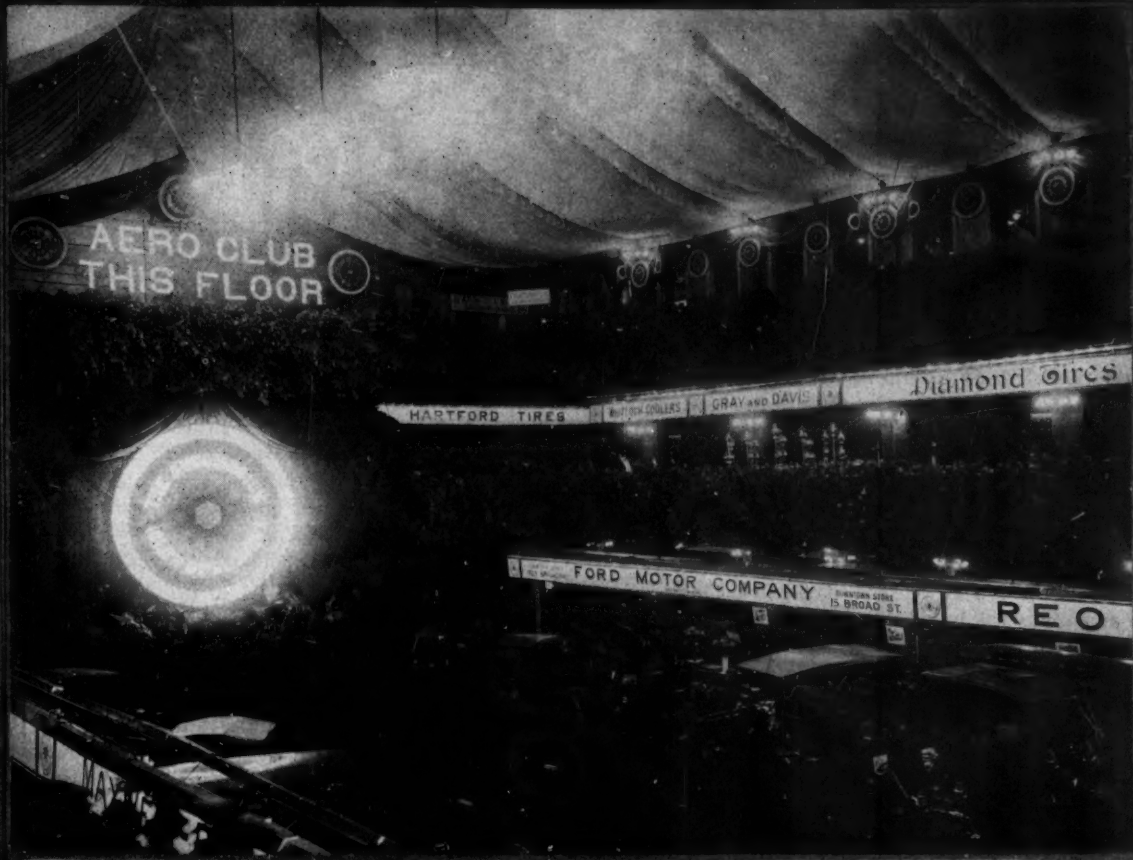
The recent international balloon race has had the effect of very greatly increasing the interest in the annual exhibit of the Aero Club of America, which is given in connection with the show. The United States has now for the first time taken up ballooning seriously. Many inspected the excellent layout of our ships and aerial apparatus. Not a few makers of motor cars were seen inspecting closely the air ship motors. This may be significant as to the possibilities of this game.



ARRIVAL OF THE NEW IMPERIAL



NORTHEAST CORNER



SOUTHEAST CORNER





Tendencies in Motor Construction

IN WELCOMING the 277 or more exhibitors to the early autumn show of 1907 Father Knickerbocker never faced a graver task than that of deciphering the compass readings—interpreting which way the stream flows in the many departments of engineering connected with motor cars and their various parts. In the infant days of the industry a blind man could see the trend towards multi-cylinder motors, sliding gear transmissions, electric instead of hot-tube ignition and pneumatic tires. But in this year of complexity, in this stage of the industry when changes and alterations are often discernible only to the trained eye, and that with the aid of telescopic imagination, it is a task of no mean proportions. The difficulty of the task increases in that the presence of over a dozen new faces in the car department brings troubles all of its own. On many of them are innovations that look good and which time alone will be the judge to decide "yes" or "no" concerning them.

Many of the old standbys look so different in 1908 attire that the buyer is in danger of passing them by without stopping to speak. This condition is hard to construe. It may be the innovations introduced by the concerns of transcontinental reputation will stand, then again it may be otherwise. In the minds of many buyers there is a feeling of independence—that spirit of "I will be my own judge and will not buy a car with new ideas on it simply because a certain maker has constructed it."

Nobody can mistake which way the wind blows on the six-cylinder question, but the problem is, how long is it going to blow that way? Of sixty-five car exhibitors sixteen different makes of six-cylinder cars are in place in the Grand Central palace, two makes are holding forth outside, while one maker shows a motor only. Twenty-five is a good big percentage of makers to include sextettes in their line of 1908 cars. The man given to making hasty deductions naturally would infer that the country has gone six-cylinder mad, but such is not the case. Many makers have brought out sixes not because they believe in them but because they cannot afford to be behind their competitors and so have the six as a talking point.

In the hearts of many makers is a kind of coldness to the sixes. One man put it: "Well, we build them because we have to, but we do not believe in them." The trouble with that maker is that he does not understand the six and naturally does not know how to build it properly. It seems that the dealers are more enthusiastic than the factory force in the praise of this type. In every booth the out-of-town dealer grabs his old customer by the arm and pulls him over to the new six while the factory representatives talk the four. The reason for this may be found in the fact that deep in the minds of many factories is the universal cry from all corners of the land for cheap cars and factory builders see in the six an increase in price rather than a drop to meet the popular demand.

The doubting Thomases who talk about 50 per cent more spark plugs, 50 per cent more coil troubles, 50 per cent more valve difficulties and 50 per cent more of everything else carry little force, as the wise user knows it is not the motor of the present car that gives the greatest trouble but rather clutches, gearsets and running gears. After the sixes have been on the road for a year the motoring fraternity will be better able to pass upon

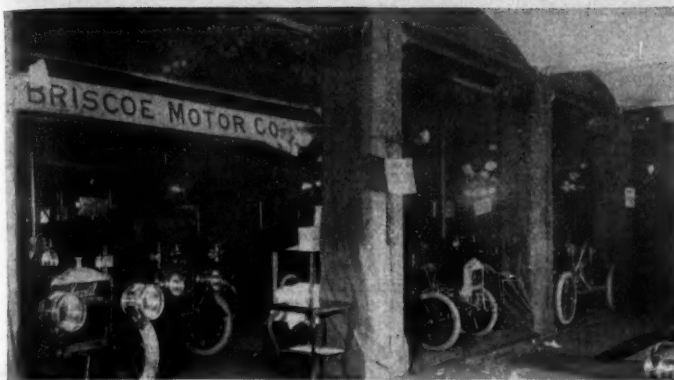
them. Before dismissing the consideration of sixes, it should be remarked that in working out the details of design the engineers have not been so successful as with their four-cylinder cars. Some of the sixes exhibited are abortions. They are masses of iron and mazes of wires that fill the entire bonnet space. Then others are well-organized power plants. In nearly every case the bonnets are too long, room being wasted between the cylinders and between the back cylinder and the dash and the front cylinder and the radiator.

In a general survey of the motor field, from the single-cylinder to the six-cylinder Chadwick or the eight-cylinder Curtiss in the Aero Club department, a few side lights are too clear to be mistaken. In every booth the inquirer after changes is greeted with a dissertation on ignition and oiling changes. There is scarcely a maker at the show who has not made alterations in the oiling. The unsightly, dirty dash oiler is almost a memory. Now it reposes close to the motor under the bonnet. Not a few makers have eliminated it altogether, preferring the crankcase-contained oiling system, in which the lower half of the crankcase is made with a basement part serving as an oil reservoir and with a gear pump to force the oil into the crankcase proper and to the motor bearings. The talk in favor of this method by such concerns as Stoddard-Dayton, Frontenac, Allen-Kingston, American Mors, Klink and many others is the extra flow of oil to each bearing and the conservation of oil in that it is used over and over again. Grease cups are hung to every part of the 1908 car, the spring eyes, steering knuckles, universal joints, etc., carrying them. Many makers have a bank of sight feeds on the dash. Those using the crankcase oiling scheme have but a single glass sight, however.

The ignition changes are two—addition of magnetos and the installing of a double system with two sets of spark plugs. Cars selling as low as \$2,500 are fitted with double systems. In not a few cases the minor system is a storage cell, single unit coil and high-tension distributor; the followers of this arrangement having increased during the year. Magnetos are all gear-driven and in every case look a part of the motor and not an excrescence. Wires for both systems are generally neatly housed in fiber conduits and in many cases the big four-unit coil is not on the dash but under the seat, and in some cases on the front of the dash under the hood.

The carburetor question has not received much attention at the hands of many makers, as they are content to buy from some carburetor makers whom they know will have a 1908 model for them and which they take without much criticism. Those makers who manufacture their own carburetors have made few alterations. In nearly every case gasoline tanks have been increased in capacity, and the popular place to carry them is under the hood. A few makers place them under the frame in the rear and of this number the Ellsworth carries it under the frame in front of the back axle. The running gasoline tank on the dash has scarcely an adherent. Governors on the motor for controlling the mixture to the carburetor are unknown, the accepted control being a steering wheel lever or accelerator pedal.

In the cooling of motors the ranks of the pump-circulation class and the thermo-siphon people remain unchanged. Maxwell and



WHERE THE MAXWELLS HOLD FORTH



REOS IN ALL STYLES EXHIBITED

Atlas are exponents of the thermo-syphon plan and the pump people are very numerous. Many new Mercedes style of radiators are in place, these being used in many cases because the makers think they are a talking point and that they make a medium-priced car look like a high-priced product. Fans in the rear of the radiators are now generally driven by wide, flat leather belts and not a few makers are driving them by bevel gears with a friction clutch for coupling the fan hub to its shaft. Wherever there is room in the flywheel the spokes are used for fan blades.

Considered structurally the motor dilemma remains unchanged. After looking over every motor exhibited it is impossible to state definitely whether the tendency is towards cylinders cast in pairs or separately, or with valves on one side or on opposite sides. The situation appears to be that the art of making cylinder castings is such that it is possible to get good single as well as twin-castings. There is not one example of four cylinders formed in one casting, although this was one of the talking points abroad a year ago. The integral water-jacket is supreme, but since the last show the Stoddard has brought out a motor with copper jackets. At present Stoddard, Chadwick and De Luxe use copper jackets. No mistake can be made as to the feeling concerning putting valves in the cylinder heads. As mentioned, the 1908 Stoddard motor is so designed and the Jackson company surprised its most intimate friends by bringing out a motor with valves placed as in Welch motors. A few of the exponents of valves in the heads, in addition to those mentioned, are Dorris, Pennsylvania, Mitchell, Ellsworth, Frayer-Miller, Moon, etc. Some of these have both valves in the head, some only the intakes and others have the intakes in the tops of the valve chambers. It is noted that all house the rocker arm supports and lubricate them thoroughly and one or two makers, using the overhead camshaft, have housed the shaft bearings and the greater part of the rocker arms. The bevel-seated valve remains and 98 per cent of the makers have the valve heads and stems formed integrally.

The four-cylinder motor is everywhere, but the two-cylinder style has experienced a revival by the inception of the buggy-style of cars fashioned after the Holsman, in all of which are used the twin-cylinder opposed motor. Three-cylinder motors are shown by the Reliance company in its truck and the Atlas concern in its touring car. Both of the three-cylinder motors are two-cycle designs. Air-coolers are still on hand, with about the same following as last year, and in their ranks are such firms as Frayer-Miller, Logan, Carter two-engine car, Marmon, which also has a water-cooled model; Holsman, Kiblinger and some others.

Concerning clutches the multiple-disk style is increasing, but the old friends of the cone style stick by it. The majority of new cars use the disk style, apparently considered a particularly good talking point. Nearly every maker who is using the disk clutch for the second season has reduced the number of disks. The three-disk or floating ring clutch seems to give good satisfaction and the clutch with nine or a dozen disks is in popular favor. On medium-priced cars the construction of a disk with fifty or sixty plates or disks would incur too great an expenditure. Invariably disk clutches operate in oil and in a few

instances, notably the new Cleveland, the clutch is contained in a forward compartment of the gearbox. Those not housing them so generally make use of a drum-like casing which is bolted to the rear face of the flywheel. In transmissions it is all selective, except on the buggy cars which use the planetary sets. Large car builders to retain the planetary sets are Ford and Reo and the new Overland runabout uses one. The cars retaining the straight sliding system can be counted on the fingers of two hands. Every maker talks chrome nickel or vanadium steel when speaking of gears and gearset shafts. Hand in hand with these go ball bearings on the higher-priced machines. Roller bearings are, if anything, growing in popularity for use in the front road wheels and rear axles and many cars have them for carrying both shafts in the gearsets. Shaft drive is omnipresent, there being but such few examples as Chadwick, Ellsworth and Reo, Reliable, Dayton and Kiblinger of chain-driven machines.

Floating rear axles are heard of everywhere, but their use is generally regulated by the price of the machine. Before dismissing transmissions attention is invited to the landslide—a small one—towards carrying gearsets on the back axle, and in view of this condition the Standard Roller Bearing Co. exhibits a combined rear axle and transmission. Cars coupling the gearsets immediately in front of the back axle or incorporating them with the axles are: Wayne, Pennsylvania, Marion, Overland, Dragon, Glide and Cameron. The exponents of friction systems are Lambert, Cartercar and the Hatfield. These systems have not being changed much since the last show.

In running gears tendencies are everywhere apparent where the price of the car will prohibit making the necessary changes. For example, double brakes on the rear wheels are accepted as proper but some makers cannot see their way clear to place them there without raising the price. In nearly every case the brake drums are of larger diameter and wider. Camels' hair cloth is the great friction surface used but a few fit bronze against steel brakes. Sprags for holding cars on hills are on the Acme and new Cleveland. Interconnecting the emergency brakes with the clutch has risen in favor and in some cases the disengagement of the clutch throttles the motor. The last mentioned change has a very small following. In every medium-priced car the frame is either dropped 3 or 4 inches in front of the rear axle—a fashion originating with the Renault and copied on the Moon car last year—or arched in Stoddard-Dayton style above the axle. The new Imperial has gone a step further and drops the frame in the rear of the front axle and in front of the back axle. The underslung frame of the American roadster is still in use but no other maker has adopted it. Frames are made with deeper vertical depth and of heavier stock. The subframe is gradually disappearing in spite of the fact that some makers would not give it up for their entire car. Springs are wider and longer. The front axle in 98 per cent of the cars is an I-beam forging. Wheelbases have not been lengthened much; wheels in several cases have been increased a couple of inches in diameter and heavier spokes are common, it evidently being the idea to guard against breakage in cases of skidding into curbstones as much as possible.

Specifications of the Cars at the A.C.A. Show

Car	Maker	Price	H. P.	Open top	Bore and stroke	Brakes	Clutch	Speed change	Drive	Ignition	Tires
American Mors, Mod. E.	St. Louis Car Co.	\$4,250	7	40	4 1/2 x 4	Int. and ext.	Cone	Sliding, selective.	Shaft	Mag. and bat.	36x4 1/2
American Mors.	St. Louis Car Co.	2,432	7	24-32	4 1/2 x 6	Band	Cone	Clash	Double chain.	Mag. and bat.	34x4 1/2
American Mors.	St. Louis Car Co.	3,500	7	40-50	4 1/2 x 6	Band	Cone	Clash	Double chain.	Mag. and bat.	34x4 1/2
American Tourist.	American Motor Car Co.	3,250	5	14-18	4 1/2 x 5	Cont. and exp.	Fan blade cone.	Sliding	Shaft	Magneto and coil.	36x4
American, Model 40.	American Motor Car Co.	3,250	2	22-40	4 1/2 x 5	Cont. and exp.	Cone	Sliding	Shaft	Magneto and coil.	36x4
American, Model 50.	American Motor Car Co.	4,000	7	50	4 1/2 x 5 1/2	Int. and ext.	Fan blade cone.	Sliding	Shaft	Magneto and coil.	36x5
American Napier	Napier Motor Co.	3,750	2	50	4 1/2 x 5 1/2	Int. exp.	Fan blade cone.	Sliding	Shaft	Magneto and coil.	36x4 and 36x3 1/2
Napier Nike	Napier Motor Co.	6,500	7	60-75	6 1/2 x 4	Int. and ext.	Cone	Sliding	Shaft	Jump spark.	36x4 1/2 and 36x5
Acme, Model 16.	Acme Motor Car Co.	2,200	2	20	4 1/2 x 4	Int. and ext.	Cone	Progressive	Shaft	Jump spark.	32x3 1/2
Acme, Model 18.	Acme Motor Car Co.	3,500	5	30	4 1/2 x 5	Int. and ext.	Cone	Sliding	Side chain.	Jump spark.	34x4
Acme, Model Sextuplet.	Acme Motor Car Co.	4,000	7	40	4 1/2 x 5	Int. and ext.	Cone	Sliding	Side chain.	Jump spark.	36x4 1/2
Allen-Kingston, Mod. D.	Kingston Motor Car Co.	3,900	4	40-45	4 1/2 x 5 1/2	Int. and ext.	Disk	Sliding	Shaft	Magneto and coil.	34x4 1/2 and 34x3 1/2
Allen-Kingston, Mod. C.	Kingston Motor Car Co.	4,100	7	40-45	4 1/2 x 5 1/2	Int. and ext.	Disk	Sliding	Shaft	Magneto and coil.	34x4 1/2 and 34x4
Allen-Kingston, Mod. E.	Kingston Motor Car Co.	5,300	7	40-45	4 1/2 x 5 1/2	Int. and ext.	Disk	Sliding	Shaft	Magneto and coil.	34x4 1/2 and 34x4
Atlas, Model B.	Atlas Motor Car Co.	1,400	2	22	4 1/2 x 4 1/2	Double	Multiple disk.	Planetary	Shaft	Jump spark.	30x3 1/2
Atlas, Model E.	Atlas Motor Car Co.	1,900	4	34	4 1/2 x 4 1/2	Double	Cone	Planetary	Shaft	Jump spark.	34x3 1/2
Austin, Model LX-T.	Austin Automobile Co.	4,500	6	60	5 1/2 x 5 1/2	Cont. and exp.	Multiple disk.	Selective	Shaft	Double	36x4 1/2
Austin, Model LX-C.	Austin Automobile Co.	5,500	7	60	5 1/2 x 5 1/2	Cont. and exp.	Multiple disk.	Selective	Shaft	Double	36x4 1/2
Austin, Model XC-T.	Austin Automobile Co.	6,000	7	90	6 1/2 x 5 1/2	Cont. and exp.	Multiple disk.	Selective	Shaft	Double	36x4 1/2
Austin, Model XC-C.	Austin Automobile Co.	6,000	6	90	6 1/2 x 5 1/2	Cont. and exp.	Multiple disk.	Selective	Shaft	Double	36x4 1/2
Austin, Model XC-L.	Austin Automobile Co.	7,000	7	90	6 1/2 x 5 1/2	Cont. and exp.	Multiple disk.	Selective	Shaft	Double	36x4 1/2
Brush, Model 1-A.	Brush Runabout Co.	500	2	6	4 x 4	Int. exp.	Cone	Planetary	Shaft	Jump spark.	32x2
Brush, Model 1-B.	Brush Runabout Co.	550	2	6	4 x 4	Int. exp.	Cone	Planetary	Shaft	Jump spark.	32x2
Brush, Model 2-A.	Brush Runabout Co.	800	4	12	4 x 4	Int. exp.	Cone	Planetary	Shaft	Jump spark.	30x3
Cameron	Cameron Motor Car Corp.	1,650	3	16	3 1/2 x 3 1/2	Int. and ext.	Cone	Selective	Shaft	Jump spark.	32x3
Carter Two-Engine.	Carter Motor Car Corp.	4,500	7	72	3 1/2 x 3 1/2	Int. and ext.	Cone	Progressive	Shaft	Jump spark.	36x4
Carter Two-Engine.	Carter Motor Car Corp.	2,500	3	40	3 1/2 x 3 1/2	Int. and ext.	Cone	Progressive	Shaft	Jump spark.	36x4
Cartercar, Model D.	Motorcar Co.	1,350	2	22-24	2 1/2 x 4 1/2	Exp. and transmission.	Exp. and transmission.	Friction	Single chain.	Jump spark.	30x3 1/2
Cartercar, Model E.	Motorcar Co.	1,350	4	22-24	2 1/2 x 4 1/2	Exp. and transmission.	Exp. and transmission.	Friction	Single chain.	Jump spark.	30x3 1/2
Cartercar, Model F.	Motorcar Co.	1,350	4	22-24	2 1/2 x 4 1/2	Exp. and transmission.	Exp. and transmission.	Friction	Single chain.	Jump spark.	30x3 1/2
Continental, Model A.	Continental Auto Mfg. Co.	2,400	3	20	4 1/2 x 4 1/2	Double	Multiple disk.	Progressive	Shaft	Jump spark.	32x4
Continental, Model B.	Continental Auto Mfg. Co.	2,700	3	35	4 1/2 x 4 1/2	Double	Multiple disk.	Progressive	Shaft	Jump spark.	34x4
Crawford, Model E.	Crawford Automobile Co.	2,500	5	35	4 1/2 x 5	Band	Multiple disk.	Sliding	Chain	Magneto and coil.	34x4
Crawford, Model D.	Crawford Automobile Co.	2,500	3	35	4 1/2 x 5	Band	Multiple disk.	Sliding	Chain	Magneto and coil.	34x4
Crawford, Model F.	Crawford Automobile Co.	3,000	5	40	4 1/2 x 5	Band and int.	Multiple disk.	Sliding	Chain	Magneto and coil.	34x4
Chadwick Great Six.	Chadwick Engineering Wks.	5,500	3	50	6 1/2 x 5	Int. exp.	Cone	Sliding	Double chain.	Battery and coil.	36x5 and 36x4
Cleveland	Cleveland Motor Car Co.	3,500	7	45	4 1/2 x 5	Internal	Multiple disk.	Selective	Shaft	Jump spark.	36x4 and 36x4 1/2
Colt	Colt Runabout Co.	1,750	2	40-50	6 1/2 x 5	Int. and ext.	Cone	Selective	Shaft	Jump spark.	34x3 1/2
Compound	Compound Motor Co.	1,700	5	20	4 x 4	Int. and ext.	Disk	Progressive	Shaft	Jump spark.	30x3 1/2
DeLuxe Touring Car.	DeLuxe Motor Car Co.	5,000	7	50	4 1/2 x 5 1/2	Metal to metal.	Cone	Selective	Shaft	Magneto	36x5 and 36x4
DeLuxe Runabout.	DeLuxe Motor Car Co.	6,250	7	50	4 1/2 x 5 1/2	Metal to metal.	Cone	Selective	Shaft	Magneto	36x5 and 36x4
DeLuxe Landauette.	DeLuxe Motor Car Co.	6,250	7	50	4 1/2 x 5 1/2	Metal to metal.	Cone	Selective	Shaft	Magneto	36x5 and 36x4
Dorris, Model C.	Dorris Motor Car Co.	2,500	3	30	4 1/2 x 5	Expanding	Multiple disk.	Selective	Shaft	Jump spark.	34x4
Dorris, Model C.	Dorris Motor Car Co.	2,500	4	30	4 1/2 x 5	Expanding	Multiple disk.	Selective	Shaft	Jump spark.	34x4
Dorris, Model C.	Dorris Motor Car Co.	2,500	6	30	4 1/2 x 5	Expanding	Multiple disk.	Selective	Shaft	Jump spark.	34x4
Dragon Roadster.	Dragon Automobile Co.	1,850	2	35	4 1/2 x 4 1/2	Int. and ext.	Cone	Sliding, progressive	Shaft	Jump spark.	32x3 1/2
Ford	Ford Motor Co.	2,800	5	40	6 1/2 x 4 1/2	Int. and ext.	Disk	Planetary	Shaft	Jump spark.	34x4
Ford	Ford Motor Co.	2,800	3	40	6 1/2 x 4 1/2	Int. and ext.	Disk	Planetary	Shaft	Jump spark.	34x4
Ford	Ford Motor Co.	600	2	15	4 1/2 x 3 1/2	Int. and band.	Disk	Planetary	Shaft	Jump spark.	28x3
Frayer-Miller	Oscar Lear Auto Co.	3,500	7	50	4 1/2 x 5 1/2	Int. and exp.	Expanding	Selective	Shaft	Jump spark.	36x4 1/2
Frayer-Miller	Oscar Lear Auto Co.	3,200	5	36	4 1/2 x 5 1/2	Int. and exp.	Expanding	Selective	Shaft	Jump spark.	32x4
Frontenac	Albendroth & Root Mfg. Co.	4,000	7	40-45	4 1/2 x 5	Cont. and exp.	Multiple ring.	Selective	Shaft	Jump spark.	34x4 1/2 and 34x4
Frontenac	Albendroth & Root Mfg. Co.	3,000	7	40-45	4 1/2 x 5	Cont. and exp.	Multiple ring.	Selective	Shaft	Jump spark.	34x4 1/2 and 34x4
Gaeth, Model 44.	Gaeth Automobile Co.	3,500	7	35-40	4 1/2 x 5 1/2	Cont. and exp.	Cont. band.	Sliding	Shaft	Make and break.	34x4
Garford	Garford Motor Car Co.	3,500	7	40	4 1/2 x 5 1/2	Int. and exp.	Cone	Selective	Shaft	Make and break.	34x4 and 34x4 1/2
Garford	Garford Motor Car Co.	3,500	3	30	4 1/2 x 5 1/2	Int. and exp.	Cone	Progressive	Shaft	Make and break.	34x4 and 34x4 1/2
Gealess	Gealess Transmission Co.	3,500	5	60	4 1/2 x 5 1/2	Transmission	Int. exp. ring.	Gearless	Shaft	Jump spark.	36x4 1/2 and 36x4
Gealess	Gealess Transmission Co.	4,000	7	75	6 1/2 x 5 1/2	Transmission	Int. exp. ring.	Gearless	Shaft	Jump spark.	36x4 1/2 and 36x4
Gealess	Gealess Transmission Co.	2,500	3	30	4 1/2 x 5	Ext. exp. disk.	Multiple disk.	Selective	Shaft	Jump spark.	34x4
Gealess	Gealess Transmission Co.	2,500	7	30-40	4 1/2 x 5	Ext. exp. disk.	Multiple disk.	Selective	Shaft	Jump spark.	34x4
Great Smith	Smith Auto Co.	2,050	5	24	4 1/2 x 5	Band and cone.	Multiple disk.	Progressive	Shaft	Jump spark.	34x4

Great Smith	Smith Auto Co.	2,650	5	24	4	4 1/2 x 5	Band and cone	Expanding	Progressive	Shaft	Jump spark	34x4
Grout	Grout Bros. Auto Co.	2,650	5	35	4	4 1/2 x 5	Int. and ex.	Cone	Friction	Double chain	Jump spark	32x4
Hatfield Bugoff	Hatfield Motor Vehicle Co.	650	2	12	2	4 1/2 x 4	Band	Cone	Friction	Double chain	Jump spark	32x4
Holsman	Holsman Auto Co.	800	2	12	2	4x4	Shoe	Holsman	Holsman	Cable	Jump spark	44x1 1/2 and 48x1 1/2
Imperial	Imperial Motor Car Co.	2,500	3	30-35	4	4 1/2 x 5 1/2	Cont. and exp.	Floating ring	Selective	Shaft	Jump spark	36x3 1/2
Jackson	Jackson Automobile Co.	1,250	5	20-24	2	5 1/2 x 5	External	Multiple disk	Planetary	Chain	Jump spark	32x3 1/2
Jackson	Jackson Automobile Co.	1,500	5	20-24	2	5 1/2 x 5	Int. and ex.	Multiple disk	Selective	Bevel gear	Jump spark	34x3 1/2
Jackson	Jackson Automobile Co.	2,000	5	35	4	4 1/2 x 5 1/2	Int. and ex.	Multiple disk	Selective	Bevel gear	Jump spark	34x3 1/2
Kiblinger	W. H. Kiblinger Co.	485	2	9	2	3 1/2 x 3 1/2	Band	Cone	Planetary	Chain	Jump spark	35x1 1/2
Kissel	Kissel Motor Car Co.	2,000	7	35	4	4 1/2 x 5 1/2	Int. and ex.	Cone	Selective	Shaft	Jump spark	34x3 1/2 and 34x4
Klink	Klink Motor Car Co.	2,000	5	24	8	4 1/2 x 5	Int. and ex.	Cone	Selective	Shaft	Jump spark	32x3 1/2
Lambert	Buckeye Mfg. Co.	800	3	18	2	5x4	Band	Cone	Friction	Single chain	Jump spark	30x3
Lambert	Buckeye Mfg. Co.	1,275	5	24	2	4 1/2 x 5	Differential and hub	Expanding	Friction	Double chain	Jump spark	32x3 1/2
Lambert	Buckeye Mfg. Co.	2,500	7	35-40	4	4 1/2 x 5	Differential and hub	Expanding	Friction	Double chain	Jump spark	32x4
Marmon	Nordyke & Marmon Co.	3,000	5	35-40	4	5 1/2 x 4 1/2	Int. exp.	Disk	Selective	Shaft	Jump spark	34x4 1/2 and 34x4
Marmon	Nordyke & Marmon Co.	3,500	7	40-45	4	5 1/2 x 4 1/2	Cont. and exp.	Multiple disk	Selective	Shaft	Jump spark	34x4 1/2 and 34x4
Marmon	Nordyke & Marmon Co.	3,500	4	40-45	4	5x5	Cont. and exp.	Multiple disk	Selective	Shaft	Jump spark	34x4 1/2 and 34x4
Marion	Marion Motor Car Co.	2,250	4	24	4	4x4	Int. and ext.	Multiple disk	Sliding	Shaft	High tension	32x3 1/2
Marion	Marion Motor Car Co.	2,250	4	24	4	4x4	Int. and ext.	Multiple disk	Sliding	Shaft	High tension	34x3 1/2
Maxwell	Maxwell-Briscoe Motor Co.	825	2	12-14	2	4 1/2 x 4	Double	Multiple disk	Planetary	Shaft	Jump spark	30x3 1/2
Maxwell	Maxwell-Briscoe Motor Co.	1,350	2	16-20	2	5x5	Cont. and exp.	Multiple disk	Sliding, progressive	Shaft	Jump spark	30x3 1/2
Maxwell	Maxwell-Briscoe Motor Co.	1,450	5	16-20	2	5x5	Cont. and exp.	Multiple disk	Sliding, progressive	Shaft	Jump spark	32x3 1/2
Maxwell	Maxwell-Briscoe Motor Co.	1,750	5	24-28	4	4 1/2 x 4 1/2	Cont. and exp.	Multiple disk	Sliding	Shaft	Jump spark	34x4 1/2 and 34x4
Mitchell	Mitchell Motor Car Co.	3,000	5	40	4	5x5	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	30x3 1/2
Mitchell	Mitchell Motor Car Co.	1,000	2	20	4	4x4	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	32x3 1/2
Mitchell	Mitchell Motor Car Co.	1,250	3	20	4	4x4	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	32x3 1/2
Moline	Moline Automobile Co.	2,800	5	35	4	4 1/2 x 5	Ext. cont.	Cone	Sliding	Shaft	Jump spark	32x4
Moline	Moline Automobile Co.	1,250	5	18	2	5x5	Contracting	Fiber faced	Planetary	Single chain	Jump spark	30x3 1/2
Moline	Moline Automobile Co.	2,000	5	24	4	3 1/2 x 4 1/2	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	32x3 1/2
Moon	Moon Motor Car Co.	3,250	3	30-35	4	4 1/2 x 4 1/2	Cont. and exp.	Multiple disk	Selective	Bevel gear	High tension mag.	34x4 1/2 and 34x3 1/2
Moon	Moon Motor Car Co.	3,500	5	30-35	4	4 1/2 x 4 1/2	Cont. and exp.	Multiple disk	Selective	Bevel gear	High tension mag.	30x4 1/2 and 30x3 1/2
Mora	Mora Motor Car Co.	3,750	7	30-35	4	4 1/2 x 4 1/2	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	32x3 1/2
Mora	Mora Motor Car Co.	2,350	3	24	4	4x5 1/2	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	32x4
Mora	Mora Motor Car Co.	2,500	3	24	4	4x5 1/2	Cont. and exp.	Cone	Sliding	Shaft	Jump spark	30x3 1/2
Mora	Mora Motor Car Co.	3,500	3	45	6	4x5 1/2	Cont. and exp.	Cone	Selective	Shaft	Jump spark	30x4
Nat.	National Motor Vehicle Co.	3,900	5	45	6	4x5 1/2	Cont. and exp.	Cone	Selective	Shaft	Jump spark	30x4
Nat.	National Motor Vehicle Co.	3,700	2	4	5x5	Internal	Internal	Cone	Selective	Shaft	Double	36x4
Nat.	National Motor Vehicle Co.	3,700	2	4	5x5	Internal	Internal	Cone	Selective	Shaft	Double	34x4 1/2
Nat.	National Motor Vehicle Co.	4,200	2	6	5x5	Internal	Internal	Cone	Selective	Shaft	Double	30x4 1/2
Nat.	National Motor Vehicle Co.	4,200	2	6	4 1/2 x 4 1/2	Internal	Internal	Cone	Selective	Shaft	Double	30x4 1/2
Nat.	National Motor Vehicle Co.	5,000	7	6	5x5	Internal	Internal	Cone	Selective	Shaft	Double	30x4 1/2
Nat.	National Motor Vehicle Co.	3,500	7	4	4 1/2 x 5	Internal	Internal	Cone	Selective	Shaft	Double	34x4 1/2
Nat.	National Motor Vehicle Co.	4,800	7	4	4 1/2 x 5	Internal	Internal	Cone	Selective	Shaft	Double	34x4 1/2
Nat.	National Motor Vehicle Co.	5,500	7	6	4 1/2 x 4 1/2	Internal	Internal	Cone	Selective	Shaft	Double	30x5
Nat.	National Motor Vehicle Co.	6,500	7	6	5x5	Internal	Internal	Cone	Selective	Shaft	Double	30x5
Overland	Overland Auto Co.	1,250	4	22-24	4	3 1/2 x 4 1/2	Internal	Cone	Planetary	Shaft	Jump spark	32x3
Pennsylvania	Pennsylvania Auto Motor Co.	2,800	4	50	4	4 1/2 x 5 1/2	Cont. and exp.	Cone	Selective	Distributor	Jump spark	34x4 1/2 and 34x3 1/2
Pennsylvania	Pennsylvania Auto Motor Co.	3,000	5	50	4	4 1/2 x 5 1/2	Cont. and exp.	Cone	Selective	Distributor	Jump spark	34x4 1/2 and 34x3 1/2
Premier	Premier Motor Mfg. Co.	2,250	5	24	4	4 1/2 x 4 1/2	Transmission and exp.	Multiple disk	Selective	Shaft	Jump spark	32x4
Premier	Premier Motor Mfg. Co.	2,500	5	30-35	4	4 1/2 x 4 1/2	Cont. and exp.	Multiple disk	Selective	Shaft	Jump spark	34x4
Premier	Premier Motor Mfg. Co.	3,750	7	45-55	6	4 1/2 x 4 1/2	Cont. and exp.	Multiple disk	Selective	Shaft	Jump spark	34x4 1/2
Rainier	Rainier Motor Car Co.	4,500	7	45	4	5x5 1/2	Internal	Multiple disk	Selective	Shaft	Make and break	30x4
Reliable	Reliable-Dayton Mot. Car Co.	925	4	15	2	4 1/2 x 4 1/2	Internal	Band	Progressive	Double chain	Jump spark	40x1 1/2 and 44x1 1/2
Reliable	Reliable-Dayton Mot. Car Co.	780	2	15	2	4 1/2 x 4 1/2	Internal	Band	Progressive	Double chain	Jump spark	40x1 1/2 and 44x1 1/2
Reo	Reo Motor Car Co.	650	4	8-10	1	Double	Double	Multiple disk	Planetary	Single chain	Jump spark	25x3
Reo	Reo Motor Car Co.	1,000	4	18-20	2	Double	Double	Multiple disk	Planetary	Single chain	Jump spark	25x3 1/2
Reo	Reo Motor Car Co.	1,250	5	18-20	2	Double	Double	Multiple disk	Planetary	Single chain	Jump spark	32x3 1/2
Richmond	Wayne Works	1,500	4	16	4	3 1/2 x 4	Internal	Cone	Progressive	Shaft	Jump spark	30x3
Richmond	Wayne Works	1,350	2	4	4	3 1/2 x 4	Internal	Cone	Progressive	Shaft	Jump spark	30x3
Schacht	Schacht Mfg. Co.	740	2	12	2	4x4	Band	Friction	Friction	Double chain	Jump spark	34x3
Schacht	Schacht Mfg. Co.	640	2	12	2	4x4	Band	Friction	Friction	Double chain	Jump spark	36x1 1/2 and 40x1 1/2
Stod-Dayton	Stod-Dayton Motor Car Co.	1,700	4	18	4	3 1/2 x 3 1/2	Transmission	Cone	Selective	Shaft	Jump spark	30x3 1/2
Stod-Dayton	Stod-Dayton Motor Car Co.	2,500	4	30-35	4	4 1/2 x 5	Int. and ext.	Cone	Selective	Shaft	Jump spark	34x4
Stod-Dayton	Stod-Dayton Motor Car Co.	2,500	7	30-35	4	4 1/2 x 5	Int. and ext.	Cone	Selective	Shaft	Jump spark	34x4
Stod-Dayton	Stod-Dayton Motor Car Co.	2,500	5	18	4	3 1/2 x 3 1/2	Transmission	Cone	Selective	Shaft	Jump spark	30x4
Stod-Dayton	Stod-Dayton Motor Car Co.	3,500	7	30-35	4	4 1/2 x 5	Int. and ext.	Cone	Selective	Shaft	Jump spark	30x4
Stod-Dayton	Stod-Dayton Motor Car Co.	4,500	7	50-60	6	4 1/2 x 5	Int. and ext.	Cone	Selective	Shaft	Jump spark	30x5
Wayne	Wayne Automobile Co.	2,500	5	30-35	4	4 1/2 x 5 1/2	Int. and ext.	Int. exp.	Selective	Shaft	Jump spark	34x4 and 34x3 1/2
Wayne	Wayne Automobile Co.	2,500	3	30-35	4	4 1/2 x 5 1/2	Int. and ext.	Int. exp.	Selective	Shaft	Jump spark	34x4 and 34x3 1/2
Welch	Welch Motor Car Co.	4,000	7	50	4	4 1/2 x 5	Int. and ext.	Multiple disk	Selective	Shaft	Mag. and but.	30x4 1/2
Welch	Welch Motor Car Co.	5,500	7	50	4	4 1/2 x 5	Int. and ext.	Multiple disk	Selective	Shaft	Mag. and but.	30x4 1/2
Welch	Welch Motor Car Co.	6,000	7	75	6	4 1/2 x 5	Int. and ext.	Multiple disk	Selective	Shaft	Mag. and but.	30x5
York-Pullman	York-Pullman Motor Car Co.	1,875	5	20	4	3 1/2 x 3 1/2	Drive shaft	Cone	Selective	Shaft	Jump spark	32x3 1/2
York-Pullman	York-Pullman Motor Car Co.	2,700	5	30	4	3 1/2 x 3 1/2	Cont. and exp.	Cone	Selective	Shaft	Jump spark	34x4
York-Pullman	York-Pullman Motor Car Co.	2,700	5	40	4	4 1/2 x 3 1/2	Cont. and exp.	Cone	Selective	Shaft	Jump spark	34x4
York-Pullman	York-Pullman Motor Car Co.	3,200	5	40	4	4 1/2 x 3 1/2	Cont. and exp.	Cone	Selective	Shaft	Jump spark	34x4 1/2
York-Pullman	York-Pullman Motor Car Co.	3,750	7	40	4	4 1/2 x 3 1/2	Cont. and exp.	Cone	Selective	Shaft	Jump spark	34x4 1/2 and 34x4

*Two-cycle. 1 Air cooled.

INVASION OF EUROPE PLANNED BY A. M. C. M. A.

NEW YORK, Oct. 28.—Special telegram—An official invasion of Europe by the members of the American Motor Car Manufacturers' Association was the decision reached at the meeting of its board of managers, which ended this afternoon. Alfred Reeves, general manager of the association, will sail for Europe next week to attend both the London and Paris shows. Mr. Reeves, who will be absent 5 or 6 weeks, will study the conditions of the markets, the type of cars most in demand and the best method of marketing them—whether through agents or by branches. He will also look into the matter of a possible united exhibit of independent cars at next year's European shows.

"The members feel," said Mr. Reeves, "that conditions abroad are now ripe for the introduction and sales of American cars. Not only can our members furnish cars for a class of people not catered to at all by European makers, but they can put cars of all grades on the European market to compete in price with similar European grades."

It was decided to extend the fight to admit gasoline vehicles to the steamship piers to all the Atlantic ports.

Thousands of additional hand books are to be printed for distribution at all the shows. B. F. Everett, of the Wayne company, was elected to the board of management. Those in attendance at the meeting were: Benjamin Briscoe, Maxwell; R. E. Olds, W. H. Van Dervoort, Moline; C. E. Hanch, Marion; Charles Lewis, Jackson; J. B. Bartholomew, Glide, and A. C. Newby, National.

Despite the rainy weather today's morning and afternoon attendance was good. That agents are pouring into town today is shown by the register at the palace. The paid attendance so far has been remarkably close to last year's figures. The gate receipts fell \$100 behind last year on the opening night, \$140 behind the second night and \$80 ahead on Saturday of the third night of the exhibition.

The Mitchell agents were entertained at luncheon today at the Cafe des Beaux Arts and the Maxwell and Jackson agents at the Manhattan.

The international balloon congress, transferred from the Jamestown exposition, is meeting today and tomorrow at the Automobile Club of America. Papers are being read by experts of the sport and army and navy. The racing board will meet on Wednesday and the committee on sanctions the same day to discuss the granting or withholding of future sanctions for circular track contests. There will be a conference of the racing board next week, with two delegates each from each of the manufacturing concerns, both licensed and independent.

Madison Square Garden Show Next

New York, Oct. 27.—Special telegram—Visitors at the Grand Central palace exhibition and New Yorkers in general are not without reminders that another show is to follow on the heels of the present one and that next Saturday night the doors of Madison Square garden will be opened on the annual motor car exposition of the Association of Licensed Automobile Manufacturers. That the second show gives are on hand to look after their preparations for their own display is very much in evidence from the presence of so many members of the licensed group of makers in the aisles of the palace. One meets them also along the row and in the hotel lobbies and restaurants favored by the motor trade. At the show there is a lot of good natured banter exchanged between the rival showmen. Each set is now almost indifferent to the show giving of the other; it has been proved that the industry and public interest in the motor car is big enough for the holding of two New York shows without either treading too hard on the corns of the other. In fact, two shows tend to increase the general boom and many think that each would be the gainer with the two to be run once more concurrently. Now that the Madison Square garden exhibition is drawing a bit nearer to hand, although its promoters have noticeably refrained from butting in very aggressively with publicity

and advertising, stories of the coming event are finding their way into the papers with perhaps a little gentle pushing by Harry Clinton, Arthur Jervis and Harry Caldwell, the trio of garden press agents, despite the natural monopoly of the motoring space by the present function. Added public anticipation is being aroused by the printing of pictures of how the garden will look in its new show clothes. It would seem that this year the beautiful amphitheater was not going to be overdressed, the pictures showing a far more simple decorative scheme. Oxblood plush and French gray silk are to be used largely and ideal plaster figures are to be mounted at intervals along the balconies. All this week the decorators, electricians, and mechanics have been at work and indications point to sure preparedness for the reception of cars next Saturday and the preliminary press view that afternoon. The licensed makers have a great advantage in holding their show at Madison Square garden. In the first place it was built for great exhibitions and its amphitheater readily lends itself to artistic arrangements and decorative embellishments. Then again the garden is a popular entertainment hall in itself with a great normal following for any function whatever that may be promoted in its vast and impressive amphitheater. The garden exhibition has also a clientele of its own, for the licensed show is just as distinctive in displaying for the most part high-priced cars as is the independent show in exhibiting machines naturally appealing by their cost mainly to the masses who are interested in motoring.

A. C. A. Smoker a Lively One

New York, Oct. 27.—Special telegram—By way of enlivening the visiting tradesmen a smoker was given at the Automobile Club of America last night. It was a snappy, rattling good show that Orrel A. Parker, the live-wire chairman of the club's entertainment committee, put up. There was enough skill in the acts, songs and stories to prove to the visitors that there was some good red sporting blood still running in the veins of the slow-going effete New Yorkers. The smoker was scheduled to begin at half-past 10 o'clock. At that time, however, things looked like a frost with fewer than fifty guests on hand; but within an hour a steady stream poured in from the show until when the vaudeville began at 11:45 there were fully 200 on hand and they for the most part belonged to the show contingent. President Colgate Hoyt started things going with a happy speech that cheered the atmosphere. He said he had come from Wall street and was satisfied that the trouble was about over and there were good times ahead. The manufacturers at the show evidently had no fears, for they had agreed to accept and were taking the checks of banks that had temporarily closed their doors. He stoutly maintained that the trouble was confined to New York and would not extend to the prosperous country outside. The show was a great success, he said, the receipts for the third night having exceeded those of the corresponding night last year. He was proud of what American makers had accomplished. Millionaires who had bought foreign cars solely now realized that equally good cars could be purchased from American makers and were buying them. He believed motor cars would continue to be used for economical reasons if for no others. As for himself his stable bills were larger than the cost of the maintenance of his motor car. Chairman Parker made a neat speech and then introduced the performers. There was quite a bevy of them, including singers, magicians, contortionists and dancers. The vaudeville wound up with a young woman's giving the dance of the seven veils, which caused the guests to take more than indifferent notice and in fact draw their chairs a trifle closer. After the performance all hands adjourned to the grill room, where supper was served. It was a case of open house all night and the visitors improved the opportunity to inspect the spacious and handsome quarters of the club. There was open house at the club all day today. The A. M. C. M. A. annual luncheon will be given at the Hotel Manhattan on Tuesday. Dinners are scheduled by the Fairweather and Flat Tire clubs.

FEELINGS OF MAKERS ON NATIONAL SHOWS

NEW YORK, Oct. 23—Special telegram—In order to obtain as accurately as possible the exact retail selling and agency-placing status of the show, a Motor Age representative made a complete tour of the booths, obtaining from the representative heads of the different firms exhibiting cars what they considered the crux of the situation. After a careful sifting of the many and varied expressions on the show a few deductions are possible. Specifically, these are broadly divided into two groups—one coming from the old, well-known and thoroughly tried-out makers, whose lines have been fixed for the past two shows, and the other from that group of makers who are either new or comparatively new both as to being makers and as to having almost revamped their product. The first pretty generally believe the day for national public shows are over and that even New York should have its show as a local one. This, of course, means that the show is too early and should be held in the spring or very late winter. Their reasoning comes from their own experiences with agents; where this agency has been mutually satisfactory the next year's terms and conditions were many times signed, sealed and delivered as early as the first of August last. So far as placing any new agencies is concerned, little has been done, as the agent who has been looking for an added or new line is expected in the last 3 days of the show, the point being that the agent does not want to stay away from his business too long and by coming at that time he can lap over his business trip into the next show. The proof offered by many of this group as to the date of showing being wrong is the falling off of the mere sight-seer, who perchance might become a car buyer if the show were held later. The many makers of this group are not averse to holding a show, but think it should be a convention and private view, like the yearly practice of the big carriage makers. These many makers assert that shows boom the industry and that they must be continued, but contend that a show held at this season of the year does not boom the industry as one would if conducted in the early spring weeks. The second group of makers above referred to have opinions influenced absolutely by their success in bringing forth a car that has classy construction, good body lines and a price which appeals both to the pocket and to the desire to own a car that has at least all the outward appearance of the higher priced and probably better known maker. The car builder who has brought a car to the Grand Central palace that suits the people and which is being sold says the show is the best or as good as any he ever attended; on the other hand, the maker who has spent weeks and months building a car that is either too high-priced for the season or because certain construction and body design do not suit the people or does not sell well, says the show is a poor one. One side is optimistic, the other pessimistic.

A feature of the show which one man thought of and in which all of the other exhibitors concurred was pointed out the day of the opening. It was this: That Sunday coming practically in the middle of the show gave a needed rest, making the attendants more on the alert for the closing days of the exhibition than was the case in other years when the show opened on a Saturday and continued for a week without let-up on the nervous vitalities of the attendants. Another show feature is the invasion of the motor buggies, which department consists of six exponents of this type of construction who have come to Gotham with the avowed purpose of introducing the car to the east. Holsman broke the ice a year ago and is here this year largely reinforced by his competitors. The motor buggy has been favorably received, but the show has not progressed sufficiently to estimate accurately the success of the invasion, because it must always be remembered that the east is conservative and may show a spirit of hanging back that will require study for cause and effect.

There are makers west of the Cleveland line who are exhibiting without a preconceived idea of doing a particularly large eastern business, although this is an eastern show. Specifically,

they believe that the east is somewhat congested both as to agencies and as to cars, and that no less than 75 per cent of their prepared-for product will be sold west of the line running through Buffalo and Pittsburg. Only one exhibitor makes the positive assertion that local sales are noticeable. Whether or not the local money scare has influenced this is a question of argument with those who optimistically look forward to a good sale when this disturbance has finally blown over.

Early Show Situation Is Discussed in New York

New York, Oct. 27—The last week in October is a little early for a Gotham show. This is true if viewed through the spectacles of the New York dealers who like to make the show a selling proposition for themselves during which time they can book orders of sales to individuals and take deposits. But is that what the A. C. A. show is for? Do the makers from a score of states bring their 1908 cars and parts to the Grand Central palace for the sole convenience of the New York dealers so they can compress into 6 days the selling possibilities of a month's work on north Broadway? It may be many have construed the show along these lines but these dealers, or whoever they may be, must remember that the A. C. A. event is a national show and that a national show is an exposition of the wares of the car and accessory makers and not a selling show for New York dealers. As a national show, the value of it consists primarily in the securing of agents by the many makers represented and also the booking of orders by these. Incidentally, the Gotham dealers count among the others who are expected to book orders and they have the additional advantage of making good use of the selling possibilities of the week of the show. The out-of-town dealer who would develop to the full the selling possibilities of the show must bring his prospective buyers to New York and induce them to buy. In the exposition sense the show is a success and as great a one, to some exhibitors at least, as any previous show. The Maxwell-Briscoe people reported that Friday was the best business day of any show they ever attended and that during the day they booked orders to dealers of 425 cars and took in \$16,000 in deposits. At the Frayer-Miller stand it was said inquiries after cars are as good as formerly and that, in short, New York dealers are getting as good lists of prospective customers as they obtained in previous shows. At both the A. C. A. and A. L. A. M. shows last year small local sales were made but the dealers got excellent lists of city buyers whom they could follow up during the spring and summer months. This is all they should expect.

If the New York dealers want a selling show they should secure space in the Grand Central palace, Madison Square garden or in their garages and hold in March or April a sales week, when with decorated salesrooms and luncheons they could produce a local show at the best selling time. Boston at present has the best proposition from a dealer's standpoint—it is a selling show and not a motor car exposition. New Yorkers can have the same if they wish it, it is argued.

For all concerned, the Automobile Club of America, the American Motor Car Manufacturers, the car builders who are not members of any association and the members of the Association of Licensed Automobile Manufacturers, as well as the sellers of imported cars, it would be better to have the three New York shows run concurrently. The three big factors in the Gotham show game already realize this. Dealers and prospective buyers would come to New York in great numbers if they knew the three shows were on at once and they would have an opportunity of seeing practically every car made in America, France, Germany, England, Italy and other countries at the same time. As it is the present show draws those people who are partial to products at the present show; others who prefer licensed or imported cars will not visit the city until these shows are on, taking the chance at that time of seeing in the New York salesrooms models of all cars exhibited at the previous shows. Then, a dealer cannot spare 3 weeks away from business.

Statistics of the Grand Palace Show

GASOLINE CARS

DETAIL	PLEASURE	COMMERCIAL	TOTAL
Complete cars	154	16	170
Complete chassis	33	2	35
Water-cooled motors	171	16	187
Air-cooled motors	16	2	18
Four-cycle motors	180	15	195
Two-cycle motors	3	3	6
Compound motors	4	0	4
Eight-cylinder motors	2	0	2
Six-cylinder vertical motors	28	0	28
Four-cylinder vertical motors	127	5	132
Three-cylinder vertical motors.....	5	1	6
Four-cylinder V motors.....	2	0	2
Two-cylinder horizontal motors—under body.....	12	10	22
Two-cylinder vertical motors.....	3	1	4
Two-cylinder opposed motors—under bonnet.....	10	1	11
One-cylinder vertical motors.....	0	0	0
One-cylinder horizontal motors.....	1	0	1
Make-and-break ignition	14	0	14
Jump spark ignition.....	173	18	191
Jump spark magneto.....	25	0	25
Jump spark batteries.....	102	16	118
Jump spark dynamo.....	0	0	0
Jump spark double.....	46	2	48
Mixed ignition	0	0	0
Sliding gear transmission.....	41	6	47
Selective gear transmission.....	117	2	119
Planetary gear transmission.....	20	10	30
Friction transmission	9	0	9
Side chain drive.....	22	17	39
Single chain drive	8	1	9
Shaft drive	157	0	157
Body—runabout	50	..	50
Body—five-passenger tourist	44	..	44
Body—seven-passenger tourist	28	..	28
Body—limousine	14	..	14
Body—landaulet	7	..	7
Body—victoria	1	..	1
Body—tourabout	9	..	9

COMMERCIAL CARS

Complete cars	16
Complete chassis	2
Shaft drive	3
Chain drive	13
Steam cars	3

ELECTRIC CARS

Complete cars	5
Complete chassis	0
Commercial cars	2
Shaft drive	0
Chain drive	5

Statistics of former New York Shows

	JAN., 1907	DEC., 1906	1906		1905	1904
	A. L. A. M. GARDEN	A. M. C. M. A. PALACE	A. L. A. M. GARDEN	A. M. C. M. A. ARMORY	GARDEN	GARDEN
TYPES OF CARS						
Gasoline cars.....	141	177	110	138	207	185
Gasoline trucks.....	..	9	13	11	7	5
Gasoline chassis	40	*48	32	39	*37	*34
Electric cars.....	34	5	25	9	20	45
Electric trucks.....	11	2	20	4	9	7
Steam cars.....	..	10	..	9	9	9
*Not included in total count.	226	251	200	210	289	285
COOLING METHODS						
Water-cooled	157	215	132	171	182	156
Air-cooled	24	19	23	17	25	29
	181	234	155	188	207	185
TYPES OF MOTORS						
Four-cycle	177	227	151	184	203	181
Two-cycle	4	2	3	1	2	3
Compound .....	..	5	..	4	2	1
	181	234	154	189	207	185
CYLINDERS						
Eight-cylinder	1	..	..	..	..	..
Six-cylinder vertical.....	10	8	2	3	2	..
Four-cylinder vertical.....	153	180	137	119	127	82
Three-cylinder	2	4	1	7	7	6
Two-cylinder opposed.....	6	32	7	41	39	41
One-cylinder vertical.....	2	..	1	..	8	14
One-cylinder horizontal.....	7	2	5	5	9	25
Other forms.....	..	7	2	13	15	17
	181	234	155	188	207	185
IGNITION						
Make-and-break	40	56	33	42	19	21
Jump spark.....	96	173	113	141	188	158
Both	45	9	9	5	..	6
	181	234	155	188	207	185
CURRENT SUPPLY						
Magneto	19	94	39	48	31	..
Batteries	117	135	107	128	157	..
Both	45	5	9	12	19	..
	181	234	155	188	207	..

FOREIGN SHOW STATISTICS

OLYMPIA—FALL 1906		PARIS—FALL 1906	
Gasoline cars.....	559	Gasoline cars.....	650
Electric cars.....	6	Electric cars.....	37
Steam cars.....	11	Steam cars.....	2
Total	576	Total	689

There were no commercial cars at Olympia; the Paris count is exclusive of 139 commercial cars; both counts include all sizes of cars—tri-cars, motorettes, racing cars and chassis.



READY TO GO INTO THE SHOW

THERE is a pronounced rivalry among the members of different families visiting the show with the avowed object of selecting a new car. The boy wants the three-seated roadster or tour-about, the father the touring car and the mother and daughter a limousine or landaulet.

A. M. Robbins, who formerly managed the New York branch of the Aerocar Co., will on November 1 take charge of the Fisk Rubber Co.'s branch in Philadelphia.

On view at the Premier stand is the mud-caked 24-horsepower stock car in which Ray McNamara recently made a round trip from Boston to New York with bonnet and high gear sealed in 23 hours 24 minutes elapsed and 20 hours 37 minutes actual running time.

That there is good stuff being put in the motor buggies is evidenced by the readiness of their exhibitors to back material as a factor of their merit. The Hatfield people, by the way, show a big frame of parts.

At only one exhibit in the entire show is there the sign "Hands off—do not touch." Exhibitors seem to appreciate that the motor car is too robustly built to be injured by the pressure of the human hand and its materials too well selected to be ruined by contact.

Al Reeves wins his bet that there would be a foreign car shown at the palace. A French machine is on view at the Quinby body exhibit.

In view of present conditions much criticism is heard of the introduction at all the shows of the dollar day feature, borrowed from abroad and first initiated by the importers' salon. It is argued that every effort should be made to increase rather than limit the attendance.

A large number of show fortnight visitors is already in town. The main body of them, however, is expected the middle of the week, which makes it possible to thoroughly inspect both shows without being away from home more than a week. The row is in receipt of many calls from the visitors. The lion's share of



motor car sight-seers along the Great White Way ultimately winds up at the Homan & Schultz garage at Sixty-second and Broadway, where Thomas B. Jeffery & Co. are displaying the 1908 Rambler line during show fortnight.

One of the most attractive exhibits in the aisles and booths was the gleaming ivories and the smile that won't come off the face of C. Benjamin, general manager of the Aerocar Redivivus. "The factory started up again on Thursday," said he. "We have lost no agencies and will be found doing business at the same old stands the coming season. You know that under our reorganization we are known as the Aerocar Motor Co."

Newspaper men all gave Joe Porter hearty handshakes of good will on his farewell to journalism and entrance to the trade through the Wayne company.

The Frayer-Miller convertible runabout is attracting considerable attention. With the rumble removed it serves for two passengers; with rumble on, for three; with two barrel seats behind, for four, and with a broad rear seat, for five. A trunk or a light delivery box can also be placed on the platform.

That the panic has not caused makers to lose their nerve is evidenced by the big advertising carried by the dailies. Despite the fact that there are no foreign cars at the show this year and that the licensed makers have butted in only to a limited extent on the independent week the Herald had forty and the Sun twenty-eight columns of advertising on Sunday, the Evening



DORRIS ROADSTER ON THE PALACE FLOOR

of the Show

Mail carrying seventeen columns on Saturday. Show advertising in the dailies will reach pretty close to 70 per cent of last year during the palace exhibition week.

Makers of shock absorbers and speedometers are taking time by the forelock and having their mechanical men measure axles and hubs so suitable brackets and other parts can be made for the different 1908 model.

There is a noteworthy lack of promiscuous demonstrations in connection with the show. The free-ride graft is about at an end. Exhibitors this time assure themselves pretty well that a man means business before he is given a fleeting view of the autumnal foliage in the park or he is put in the way of having his face fanned by the October zephyrs of Riverside drive.

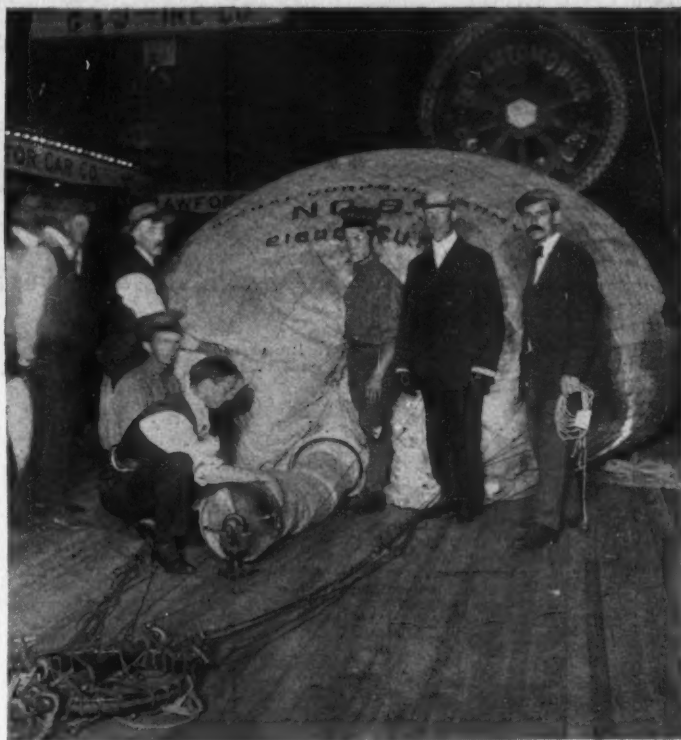
Paul Gaeth cannot lose that perfect score smile that he won on the Cleveland endurance test, when explaining the makes-and-breaks of the new Gaeth.

"The smile that won't come off"—the out-of-town dealer approaching the palace in the taxicab.

"Although we have not yet closed any sales," said H. H. Knepper at the Frayer-Miller booth Saturday afternoon, "we are well satisfied from the fact that we have accumulated a big list of investigators interested in our cars. We have met the demand for low prices by cutting our 50's \$500 and our 24's \$250. Now that our factory is settled in its new location we will no longer



HEAD-ON VIEW OF THE MARION



INFLATING BALLOON OF THE U. S. A. SIGNAL CORPS

be handicapped by slow deliveries, which cost the New York branch many a sale last season. We feel pretty proud of our judgment on the six-cylinder proposition. Three years ago, you know, we made and delivered the first six-cylinder American car. The exact day was August, 1905."

"If there be any kick about the price of trade tickets being set at 50 cents," said Alfred Reeves, general manager of the A. M. C. M. A., "it is unreasonable. The members themselves wanted it that way. This year we send an exhibitor a bunch of trade tickets, which he pays for in advance. He receives a rebate on all tickets not used. The tickets come out of the box with the names and addresses of those who have used them."

The result of the Diamond Rubber Co.'s tire count of the show was given in big advertisements on Sunday. The company claims 32½ per cent of the total tire equipment, twelve other makes dividing the remainder. Its figures are sixty-two sets of Diamond tires as against thirty-seven sets of the next highest make and twenty-three sets of the third highest make.

Ray Owen has made a big hit with his scenograph of the Lansing factory at the Reo berth. There always is a big crowd gathered to watch the changing lights within and without the plant and the little cars chasing one another around the testing track.

Next year should be the season for the introduction of eight-cylinder cars.

A noticeable fact is that the demonstrating ranks outside of the show do not contain as many commercial machines as formerly, a condition undoubtedly occasioned by the feeling within the minds of buyers that the commercial vehicle is beyond the experimental stage and will actually go and keep going.

The fact that the accessory exhibits are more crowded generally than the car exhibits does not necessarily signify that fewer people are buying cars than formerly but shows that buyers are not content to take the word of the salesman regarding the best and most suitable make of tires, lamps, shock absorbers, speedometers, and other equipments.

DIRECTORY of the SHOW

Motor Cars

- Abendroth & Root Mfg. Co., Newburgh, N. Y.—Frontenac
One touring car, one limousine, one roadster
- Acme Motor Car Co., Reading, Pa.—Acme
One six-cylinder touring car, one four-cylinder touring car, one Brewster body
- American Motor Car Co., Indianapolis, Ind.—American
One touring car, two roadsters, one chassis
- Anderson Carriage Co., Detroit, Mich.—Detroit
One electric phaeton, one electric coupe
- Atlas Motor Car Co., Springfield, Mass.—Atlas
One touring car, two runabouts
- Austin Automobile Co., Grand Rapids, Mich.—Austin
One six-cylinder touring car, one six-cylinder roadster, one four-cylinder limousine
- Bartholomew Co., Peoria, Ill.—Glide
Two touring cars, one landaulet, one motor
- Brush Runabout Co., Detroit, Mich.—Brush runabout
Two runabouts, one delivery wagon
- Buckeye Mfg. Co., Anderson, Ind.—Lambert
Two touring cars, one runabout, one chassis
- Cameron Car Co., Brockton, Mass.
One Cameron roadster, one runabout
- Carter Motor Car Corporation, Detroit, Mich.—Carter
two-engine car
Two eight-cylinder touring cars
- Chadwick Engineering Works, Philadelphia, Pa.—Chadwick
One six-cylinder touring car, one six-cylinder roadster, one six-cylinder chassis
- Cleveland Motor Car Co., Cleveland, Ohio—Cleveland
One touring, one opera coach, one roadster, one chassis
- Colt Runabout Co., New York—Colt
One six-cylinder runabout, one six-cylinder chassis
- Continental Automobile Mfg. Co., New Haven, Conn.—Continental
One touring car, one roadster, one cabriolet or park car
- Crawford Automobile Co., Hagerstown, Md.—Crawford
One touring car, one landaulet, one chassis
- Dayton Motor Car Co., Dayton, Ohio—Stoddard-Dayton
One six-cylinder touring car, one four-cylinder touring car, one limousine, two roadsters, one town car, one doctor's car, one six-cylinder chassis, one four-cylinder chassis
- De Luxe Motor Car Co., Detroit, Mich.—Car De Luxe
Two touring cars, one chassis
- Dorris Motor Car Co., St. Louis, Mo.—Dorris
One touring car, one limousine, one roadster, one chassis
- Dragon Automobile Co., Philadelphia, Pa.—Dragon
One touring car, one roadster, one landaulet body
- Eagle Motor Co., Middletown, Conn.—Compound
Two touring cars, one runabout, one chassis
- J. M. Ellsworth, New York—Ellsworth
One chassis, one Brewster body
- Ford Motor Co., Detroit, Mich.—Ford
One six-cylinder touring car, one six-cylinder roadster, two light runabouts
- Gaeth Automobile Works, Cleveland, Ohio—Gaeth
One touring car, one chassis
- Garford Motor Car Co., New York—Garford
Three touring cars, three landaulets, two limousines, one runabout, one Mylord, one chassis
- Gearless Transmission Co., Rochester, N. Y.—Gearless
One six-cylinder touring car, one four-cylinder touring car, one six-cylinder roadster, one chassis
- Grout Brothers, Orange, Mass.
One Grout touring car and one chassis, gasoline
- Hatfield Motor Vehicle Co., Miamisburg, Ohio—Hatfield
Buggyabout
One runabout, one chassis
- Holsman Automobile Co., Chicago, Ill.—Holsman
One surrey, one phaeton
- Imperial Motor Car Co., Williamsport, Pa.—Imperial
Two roadsters, one chassis
- Jackson Automobile Co., Jackson, Mich.—Jackson
Three touring cars, one roadster, one chassis
- W. H. Kiblinger Co., Auburn, Ind.—Kiblinger
One runabout, one chassis
- Kingston Motor Car Co., Kingston, N. Y.—Allen-Kingston
One touring car, one limousine, one roadster
- Kissel Motor Car Co., Hartford, Wis.—Kisselkar
One touring car, one limousine, one chassis
- Klink Motor Car Mfg. Co., Dansville, N. Y.—Klink
One touring car, one roadster
- Lane Motor Vehicle Co., Poughkeepsie, N. Y.—Lane
One touring car, one roadster, one runabout
- Lansden Co., Newark, N. J.—Lansden
One touring car, one panel delivery wagon, one open delivery wagon
- Logan Construction Co., Chillicothe, O.—Logan
One delivery wagon, one light chassis, one heavy chassis
- Mack Brothers Motor Car Co., Allentown, Pa.—Manhattan
One sightseeing car, one 5-ton truck
- Marion Motor Car Co., Indianapolis, Ind.—Marion
One six-cylinder roadster, two four-cylinder roadsters
- Maxwell-Briscoe Motor Co., Tarrytown, N. Y.—Maxwell
Two four-cylinder touring cars, one two-cylinder touring car, one limousine, one four-cylinder runabout, one four-cylinder chassis, one two-cylinder chassis
- Mitchell Motor Co., Racine, Wis.—Mitchell
One touring car, one limousine, one roadster, one runabout
- Moline Automobile Co., East Moline, Ill.—Moline
One four-cylinder touring car, one two-cylinder touring car
- Moon Motor Car Co., St. Louis, Mo.—Moon
Two touring cars, one roadster, one chassis
- Mora Motor Car Co., Newark, N. Y.—Mora
One six-cylinder touring car, one six-cylinder racytype, one four-cylinder touring car, one four-cylinder racytype, one six-cylinder chassis, world's record sealed bonnet car.
- Motorcar Co., Detroit, Mich.—Cartercar
One touring car, one chassis
- Napier Motor Co. of America, Jamaica Plains, Boston—American Napier
One six-cylinder chassis, one victoria rumble
- National Motor Vehicle Co., Indianapolis, Ind.—National
One large six-cylinder touring car, one small six-cylinder touring car, one four-cylinder touring car, one roadster, engine and transmission
- Nordyke & Marmon Co., Indianapolis, Ind.—Marmon
Two touring cars, one runabout, one chassis
- Oscar Lear Auto Co., Springfield, O.—Frayer-Miller
Two touring cars, two roadsters
- Overland Auto Co., Indianapolis, Ind.—Overland
One roadster, one chassis
- J. M. Quinby & Co., Newark, N. J.—Aluminum bodies
Limousine body, demi-limousine body, touring body, runabout body
- Pennsylvania Auto Motor Co., Bryn Mawr, Pa.—Pennsylvania
One touring car, one roadster, one chassis
- Premier Motor Mfg. Co., Indianapolis, Ind.—Premier
One six-cylinder touring car, two four-cylinder touring cars, one limousine, one roadster
- Rainier Motor Car Co., New York—Rainier
One limousine, one landaulet, one chassis
- Rapid Motor Vehicle Co., Pontiac, Mich.—Rapid
Four trucks, one police patrol, one theater bus, two wagonettes, Pontiac runabout

DIRECTORY of the SHOW

Motor Cars

Reliable Dayton Motor Car Co., Chicago, Ill.—Reliable Dayton
One doctor's car, one runabout, one chassis
Reliance Motor Car Co., Detroit, Mich.—Reliance
One 5-ton truck, one 2-ton truck, one chassis
Reo Motor Car Co., Lansing, Mich.—Reo
Two touring cars, two runabouts, one chassis
St. Louis Car Co., St. Louis, Mo.—American Mors
One six-cylinder touring car, one six-cylinder chassis, one four-cylinder limousine, one four-cylinder touring car
Schacht Mfg. Co., Cincinnati, O.—Schacht
Two runabouts, one phaeton

Smith Auto Co., Topeka, Kan.—Great Smith
One touring car, one roadster
Wayne Automobile Co., Detroit, Mich.—Wayne
One touring car, one roadster, one tourabout, one chassis
Wayne Works, Richmond, Ind.—Richmond
Two touring cars
Welch Motor Car Co., Pontiac, Mich.—Welch
One six-cylinder limousine, one four-cylinder touring car
York Auto Car Co., York, Pa.—Pullman
Two touring cars, two roadsters

Accessories

Acetyvone Co., Niagara Falls, N. Y.
Acetyvone acetylene generators and specially prepared carbide
Acme Spring Check Co., New York
The Shocsorber shock absorber
Ajax-Grieb Rubber Co., New York
Ajax clincher and detachable tires
Allen Auto Specialty Co., New York
Tire covers, tire holders and tire locks
American and British Mfg. Co., Bridgeport, Conn.
Herreschoff motor car and marine engines, pressed steel frames and parts, and drop forgings
American Ball Bearing Co., Cleveland
Complete axle equipments
American Electric Novelty and Mfg. Co., New York
Ever Ready dry batteries
Ampere Mfg. Co., New York
The Best dry batteries
Atwater-Kent Mfg. Works, Philadelphia
Atwater-Kent spark generators
Aurora Automatic Machine Co., Aurora, Ill.
Thor motors
Auto Check Mfg. Co., New York
Rountree-Stimmel auto check
Auto Igniter Co., New York
Flaming pocket lighter
Autocoll Co., Jersey City, N. J.
Autocoll spark coils
Auto Accessories Mfg. Co., Detroit
Bodies, tops, wind shields, and tire covers
Auto Improvement Co., New York
Eveready starters, tire tools, spark plugs, speedometers, and vulcanizers
Auto Pump Co., Springville, N. Y.
Spencer tank gauges and power air pumps
Autolyte Mfg. Co., New York
Autolyte sirens and speedometers, Climax lamps and dry batteries
Auto Supply Mfg. Co., Brooklyn
Nonpareil horns
Auto Spring Repairer Co., New York
Auto spring repairer
Automobile Utilities Co., Boston
Shaw self-sealing inner tube
Badger Brass Mfg. Co., Kenosha, Wis.
Solar acetylene heads and side lights, Solar acetylene generators
Baldwin Chain and Mfg. Co., Worcester, Mass.
Baldwin motor car chains and bicycle chains
Gus Balzer, New York
Monograms, crests and signs
S. F. Bowser & Co., Fort Wayne, Ind.
Bowser gasoline pumps, tanks, wheel tanks and lubricating oil cabinets
Breeze Carbureter Co., Newark, N. J.
Breeze carbureters
J. S. Bretz Co., New York
F. & S. ball bearings and Unterberg & Helmle magnetos
Briscoe Mfg. Co., Detroit
Briscoe radiators, mud-guards, fenders, dashes, hoods, etc.
Brooke Automobile Supply Co., New York
Accessories, and supplies of all kinds

Brown-Lipe Gear Co., Syracuse, N. Y.
Transmissions, differentials, and steering gears
Brownell Motor Co., Rochester, N. Y.
Four and six-cylinder motor cars and marine engines
Byrne-Kingston Co., Kokomo, Ind.
Kingston carbureters
Clover Mfg. Co., New York
Clover grinding compound
Coes' Wrench Co., Worcester, Mass.
Wrenches of all sizes
Cohn, Frank & Co., Brooklyn
Argyle motor car boots
Columbia Nut and Bolt Co., Bridgeport, Conn.
Columbia lock nuts
Commonwealth Rubber Co., Reading, Mass.
Mitchel punctureless pneumatic tire
Comptoir d'Innovations pour Automobiles, Paris, France
Delpeuch tire inflators, Delpeuch jacks, and Nightingale whistles
Connecticut Telephone and Electric Co., Meriden, Conn.
Connecticut coils, timers, switches, voltmeters, and trouble finders
Consolidated Optical Co., New York
Goggles, driving glasses, and reading glasses
Continental Caoutchouc Co., New York
Continental tires and Vinet dismountable rims
C. Cowles & Co., New Haven, Conn.
Annunciators, dome lights, electric limousine lights, locking handles, switches, and leather cases
William Cramp & Sons' Ship and Engine Building Co., Philadelphia
Parsons' manganese bronze castings and Parsons' white brass bearing metals
Crown Battery Co., New York
Crown dry batteries
W. Smalley Daniels, Boston
Lennox tire tanks, Bemus timers, and Covert jacks
Dayton Electrical Mfg. Co., Dayton, Ohio
Apple ignition and lighting apparatus, dynamos, and storage batteries; Apple automatic switchboard
J. E. Demar, New York
Crescent removable rim
Diamond Chain and Mfg. Co., Indianapolis
Diamond chains and Diamond I-beam axles
Diamond Rubber Co., Akron, Ohio
Diamond tires, Diamond detachable rims, Marsh rims, and wire mesh base solid tire
Diezemann Shock Absorber Co., Hoboken, N. J.
Diezemann shock absorbers
Joseph Dixon Crucible Co., Jersey City, N. J.
Graphite lubricants
Dow Portable Electric Co., Braintree, Mass.
Domet high tension magneto, Dow spark coils and spark plugs
C. J. Downing, New York
Husk motor chimes, Genesee clincher tire, and American lamps
W. J. Duane & Co., New York
Voltz wind shield, Schildbach wind shield, and Beecher wind shield
Eastern Carbon Works, Jersey City, N. J.
Eastern dry batteries

DIRECTORY of the SHOW

Accessories

- Edmunds & Jones Mfg. Co., Detroit
Motor car and marine lamps and launch whistles
- Electric Storage Battery Co., Philadelphia
Exide storage batteries
- Elite Mfg. Co., Ashland, Ohio
Reliable jacks and tire pumps
- E. & M. D. Co., Asbury Park, N. J.
Hickley alternating rectifiers, Kisko specialties
- Empire Auto Tire Co., Trenton, N. J.
Empire tires
- F. R. V. Auto Parts Co., New York
F. R. V. shock absorbers, differentials, and lubricants
- Firestone Tire and Rubber Co., Akron, Ohio
Firestone pneumatic and solid tires
- Fisk Rubber Co., Chicopee Falls, Mass.
Fisk tires and mechanical rims
- Gabriel Horn Mfg. Co., Cleveland, Ohio
Gabriel horns and Gabriel shock absorbers
- Geisler Brothers, New York
Geisler storage batteries
- Gemmer Mfg. Co., Wabash, Ind.
Gemmer steering gears
- Gilbert Mfg. Co., New Haven, Conn.
Tools, tire irons, tire cases, leather goods, rubber goods and accessories
- B. F. Goodrich Co., New York
Goodrich tires
- Goodyear Tire and Rubber Co., Akron, Ohio
Goodyear tires and Goodyear universal rims
- G & J Tire Co., Indianapolis
G & J tires, Midgley rims and sundries
- Gray & Davis, Amesbury, Mass.
Gray & Davis lamps and Gray & Davis acetylene generators
- Gray-Hawley Mfg. Co., Detroit
Gray mufflers, Autochime horn, cut outs and steam and air whistles
- C. T. Ham Mfg. Co., Rochester, N. Y.
Ham's cold blast lamps
- Hancock Mfg. Co., Charlotte, Mich.
Hancock oilers, tank gauges, hand rails, foot rails, monograms, name plates, brass pipe fittings, etc.
- A. W. Harris Oil Co., Providence, R. I.
Harris oils, greases, polishes and transmission compounds
- Hartford Rubber Works, Hartford, Conn.
Hartford tires and Dunlop tires
- Hartford Suspension Co., New York
Truffault-Hartford shock absorber
- Hayes Mfg. Co., Detroit
Metal bodies, metal tool and battery boxes, garage floor pans, hoods, mud guards and forged irons
- Hartford Auto Parts Co., Hartford, Conn.
Parts for universal joints
- Heinze Electric Co., Lowell, Mass.
Heinze spark coils and Heinze magnetos
- Herz & Co., New York
Herz timers and ignition apparatus, Paternoster shock absorber, B-B. pump
- Hess-Bright Mfg. Co., Philadelphia
Hess-Bright ball bearings
- Hicks Speed Indicator Co., Brooklyn
Hicks speed indicator
- Hill Mfg. Co., Buffalo, N. Y.
Bodies, tops, wind shields and auxiliary seats
- Home Rubber Co., Trenton, N. J.
Home pneumatic tires
- P. M. Hotchkiss Mfg. Co., Chicago
Hotchkiss anti-jolt device
- Hyatt Roller Bearing Co., Newark, N. J.
Hyatt roller bearings
- Index Speed Indicator Co., Minneapolis, Minn.
Index speed indicators
- International Auto Horn Mfg. Co., New York
International horns, tubing and reeds
- Jeffery-DeWitt Co., Newark, N. J.
Reliance spark plug
- Jef Mfg. Co., Denver, Col.
Jef valve grinder
- Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.
Steel castings
- Jones Speedometer Co., New York
Jones speedometers and Chelsea clocks
- K. W. Ignition Co., Cleveland, Ohio
K. W. magnetos, spark plugs, spark coils and vibrators
- Julius King Optical Co., New York
The Goggles, goggles and accessories
- Kinsey Mfg. Co., Dayton, Ohio
Kinwood radiators, hoods and frames
- Charles L. Klauder, Philadelphia
Five Brothers chrome tanned leather
- Kokomo Electric Co., Kokomo, Ind.
Kingston coils, timers, plugs and switches
- Richard E. Krause, Cleveland, Ohio
Krause carburetor and Krause slow speed rotary motor
- Lavalette & Co., New York
Eisemann-Lavalette magnetos, R. B. F. ball bearings, Mallot & Blin differentials, transmissions and steering gears and Lemoine axles and springs
- Leather Tire Goods Co., Newton Upper Falls, Mass.
Woodworth treads and Woodworth tires
- Light Mfg. and Foundry Co., Pottstown, Pa.
Aluminum, brass and bronze castings
- Long & Mann Co., Rochester, N. Y.
L. & M. removable rims, L. & M. tire tools and Perfect washer
- Loring Auto Appliance Co., New York
Loring speed gauge
- Roger B. McMullen, Chicago
Hydraulic Pressed Steel Co.'s pressed steel motor car frames and parts
- Leon Mann Co., New York
Motor car clothing
- Manhattan Screw and Stamping Works, New York
Phoebus acetylene lamps and accessories
- John W. Masury & Sons, New York
Paints and varnishes
- Merchant & Evans Co., Philadelphia
Hele-Shaw clutches, Evans change-speed gears, Star metal tire cases and imported axles
- Metal Stamping Co., New York
Radiators, handles and body fixtures
- Michelin Tire Co., Milltown, N. J.
Michelin tires
- Midgley Mfg. Co., Columbus, Ohio
Midgley pressed steel wheels and Midgley detachable rims
- Charles E. Miller, New York
Miller speedometers, Miller spark plugs, chains and accessories
- William P. Miller's Sons, Long Island City, N. Y.
Pan-o-lite oil, Excelsior cylinder oils, Excelsior fibrous oil and Miller's grease
- Model Mfg. Co., New York
The Timeograph and Acme tire chains
- Morgan & Wright, Detroit
Morgan & Wright tires and Morgan & Wright-Midgley rims
- Morrison, McIntosh & Co., Grinnell, Iowa
Rist-Fit and ventilated gloves
- A. R. Mosler & Co., New York
Split Fire spark plugs
- Motor Car Specialty Co., Philadelphia
Lea speedistometer, Phelps vehicle recorder and Boss filter
- Motz Clincher Tire and Rubber Co., New York
Motz solid and cushion tires
- Nathan Novelty Mfg. Co., New York
Tire covers, coat rail bags, motor trunks, motor leggings, Carryall tire trunks
- National Battery Co., New York
National storage batteries
- National Carbon Co., New York
Columbia Igniters, coils, connectors, etc.
- National Sales Corporation, New York
Conover wind shield, Royal batteries, Multiplex lamps, Pirelli tires and Peugeot chains
- National Surety Co., New York
Ball bonds

DIRECTORY of the SHOW

Accessories

- Newmastic Tire Co., New York
Newmastic tire filling and Parker rims
- New York Auto Lamp Co., New York
Atlas and other lamps
- New York Coil Co., New York
Coils and lock switches
- New York and New Jersey Lubricant Co., New York
Non-fluid oils and motor car cylinder oils
- New York School of Automobile Engineers, New York
Complete alcohol engine, sections of motors, transmissions, etc.; complete ignition systems
- New York Sporting Goods Co., New York
Special lamp sets, Pittsfield coils and French Dragon horns
- Noon Tool and Machine Works, Rome, N. Y.
Motor car tools
- Norris Auto Co., Saginaw, Mich.
Standard tire protector
- Norton Co., New York, and Norton Grinding Co., New York
Alundum grinding wheels and ground crank shafts
- Oliver Mfg. Co., Chicago
Peerless jacks
- Ovington Motor Co., New York
Motor cycles and parts
- Pacific Iron Works, Bridgeport, Conn.
Four-cylinder engines
- Pantasote Co., New York
Pantasote upholsterings, tops and coverings
- Patterson, Gottfried & Hunter, New York
Empire repair kit, Elite repair kit, P. G. & H. bearing scrapers, Yemco quick acting wrench and Victor belt couplings
- Pederson Mfg. Co., New York
Pederson lubricators, wrenches, oil burners and special tools
- Pennsylvania Rubber Co., Jeanette, Pa.
Pennsylvania tires
- Perfection Spring Co., Cleveland, Ohio
Perfection springs
- Pneu l'Electric Co., New York
Pneu l'Electric tires, Grounelle & Arquembouy carbureters
- Post & Lester Co., Hartford, Mass.
Royal lamps and igniters, Boiler horns, Accuro voltmeters, M. & M. cement, luminous clocks, tire cases, etc.
- Presto Detachable Rim, Jersey City, N. J.
Presto detachable rim
- Prest-O-Lite Co., New York
Prest-O-Lite gas tanks and air tanks
- Thomas Prosser & Son, New York
Krupp steel gears, crank shafts, axles, etc.
- Raimes & Co., New York
Globe metal polish
- Randall-Faichney Co., Boston
B-line oil and grease guns, B-line auxiliary dash feed pump and Webster gasoline gauge
- Rands Mfg. Co., Detroit
Tops, wind shields, lamp brackets, etc.
- Remy Electric Co., Anderson, Ind.
Remy high tension alternating current magnetos
- Republic Rubber Co., Youngstown, Ohio
Republic tires, Republic detachable and clincher rims
- Rose Mfg. Co., Philadelphia
Neverout acetylene lamps and Neverout acetylene generators
- Regal Coat Co., New York
Hydgrade cravanette coats
- J. H. Sager Co., Rochester, N. Y.
Sager flexible spring, Sager equalizing spring, Sager cushion forks
- Saxon Lamp Co., New York
Saxon acetylene lamps and Saxon acetylene generators, motor car annunciators
- Scandinavian Fur and Leather Co., New York
Motor car wearing apparel, goggles, etc.
- Schwarz Wheel Co., Philadelphia
Artillery wheels
- C. A. Shaler Co., Waupun, Wis.
Shaler electric vulcanizer
- Shelby Steel Tube Co., Pittsburg
Seamless steel tubing
- R. H. Smith Mfg. Co., Springfield, Mass.
Springfield motometers
- Spicer Universal Joint Co., Plainfield, N. J.
Spicer universal joints
- C. F. Splittdorf, New York
Splittdorf magnetos, coils, timers, etc.
- Sprague Umbrella Co., Newark, N. J.
Sprague tops and Sprague wind shields
- Springfield Portable Construction Co., Springfield, Mass.
Springfield portable garages
- Standard Brake Co., New York
Cork inserts for clutches
- Standard Roller Bearing Co., Philadelphia
Standard transmission axle, Standard roller bearings and Standard annular ball bearings
- Standard Welding Co., Cleveland, Ohio
Rims and tubes
- Stewart & Clark Mfg. Co., Chicago
Stewart speedometer and American speedometer
- Joseph Stokes Rubber Co., Trenton, N. J.
Hard rubber goods, steering wheels and handles
- Oscar Stolp Co., New York
Stolp shock absorber
- Supplementary Spiral Spring Co., St. Louis, Mo.
Supplementary spiral springs
- Swinehart Clincher Tire and Rubber Co., Akron, Ohio
Swinehart pneumatic tires
- Timken Roller Bearing Axle Co., Canton, Ohio
Timken roller bearings, differentials, rear axles, etc.
- Travelers' Insurance Co., Hartford, Conn.
Motor car insurance
- Traver Blowout Patch Co., New York
Traver blowout patch
- Trenton Rubber Mfg. Co., Trenton, N. J.
Thermoid brake lining, floor coverings and inner tubes
- Tripair Bros. & V. de Prisco Co., New York
Tripair lamps
- Triumph Engineering Co., Brooklyn, N. Y.
Holsten vibrating plug
- Troy Carriage Sunshade Co., Troy, Ohio
Troy front
- Turner Brass Works, Sycamore, Ill.
Name plates, whistles, pumps, brass fittings, etc.
- Veeder Mfg. Co., Hartford, Conn.
Veeder tachometers
- Ventilated Cushion and Spring Co., Jackson, Mich.
Rough Rider springs and ventilated buttons
- Victor Shock Absorber Co., New York
Victor shock absorbers
- Warner Gear Co., Muncie, Ind.
Transmissions, differentials and steering gears
- Warner Instrument Co., Beloit, Wis.
Warner autometer, Warner cutmeter, Warner railway speedometer and Warner anemometer
- Weed Chain Tire Grip Co., New York
Weed chain tire grips
- West Side Y. M. C. A. Auto School, New York
Photographs of classes in motor car construction and instruction
- Western Electric Co., Chicago
W. E. synchronized ignition system, the 1900 dry batteries and Recti bells
- Wheeler & Schebler, Indianapolis
Schebler carbureters
- Whitlock Coil Pipe Co., Hartford, Conn.
Whitlock radiators, motor connections and bent pipes
- Whitney Machine Co., Hartford, Conn.
Whitney chains, Woodruff keys, Presto drill chucks, etc.
- Winchester Speedometer Co., New York
Winchester speedometers
- Witherbee Igniter Co., New York
Witherbee storage batteries, Wico specialties, spark plugs, timers, etc.
- William Wooster, New York
Elastic tire filler, lamps, horns and accessories



THAT there should be sixteen different makes of six-cylinder motor cars distributed among the sixty-five stands of car manufacturers shows the strength of this popular type. That means 25 per cent, which certainly is a good showing. In addition there are two other sixes shown outside the palace, while two six-cylinder motors, unmounted, are seen on one of the stands. The sixteen sixes in the palace are: Marion, Acme, Ford, Mora, Stoddard-Dayton, Premier, York Pullman, National, Welch, Glide, Colt, Chadwick, Gearless, Austin, Frayer-Miller and Napier. The Thor and Trebert motors also are shown.

The Marion is wired to give its explosion along the crankshaft in this order of cylinder numbers, 1-5-3-6-2-4 and is the only car having that order. In carrying out the idea of giving an equal feed or pressure at each intake port, the cylinders being separately cast, the riser from the carbureter goes to a horizontal tube, each end feeding a parallel tube at one-quarter and three-quarters the latter's length. This latter has an opening at each end and a third at the center, each feeding to a flatted U-shaped branch to two cylinders. The over-all length of the cylinders is 30 inches with 13 inches added for clearance between dash and radiator. The flywheel is 15½ inches in diameter and weighs 65 pounds. The bore and stroke are equal, 3¾ inches being the measurement. A double high tension ignition system is used, magneto and battery with coil.

The Acme is one of three cars in which the order of explosions is 1-2-3-6-5-4. No attempt is made to by-pass or side-shoot the gas run from the carbureter to the engine. The riser runs to a horizontal tube which has six rear openings to the separated cylinders, of 4½ by 5 dimensions. The cylinders occupy a space 38½ inches in length and the distance from the radiator to dash is 46 inches. The flywheel at 70 pounds has a diameter of 18 inches. There are four speeds with the direct drive on high. The oiling is by force feed to the different bearings, the fill oiler being carried on the left rear leg of the motor base. Ignition is by the double system of high tension magneto with battery and coil for emergency use.

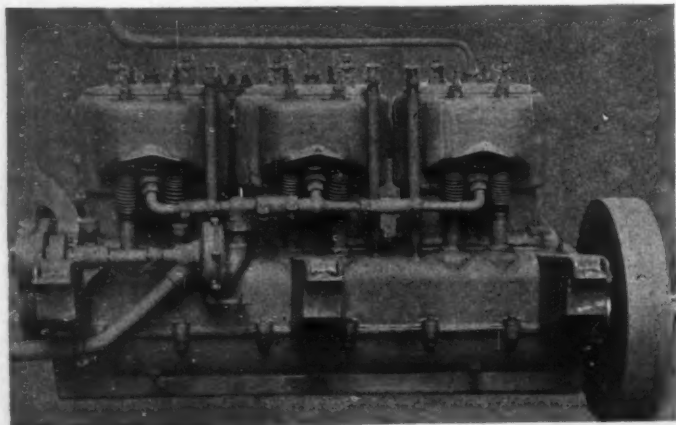
The explosion order of cylinder numbers 1-2-3-6-5-4 is used on the Ford six at the show, but whether this will be the order in

the 1908 models is one of the things to be learned later, as it is an open secret that the Fords for next year are not on exhibit. The intake manifold is in effect a straight-across tube with three enlargements, one at each end and one in the center, each enlargement feeding to two cylinders, the latter not being in pairs, however. The feed to the manifold, from the carbureter, is to the approximate center of the central enlargement. The 42 by 4 cylinders occupy an over-all length of 40 inches and the dash to radiator distance is 4 feet. A 15½-inch flywheel, weighing 68 pounds, is used and the drive is of the well-known Ford two-speed planetary. The bearings are plain, oiled by a McCord force feed oiler set on the left front leg of the engine base. Ignition is by magneto, also by battery.

The Mora is one of the three makes that carries the order of explosion as 1-2-3-6-5-4, in cylinder numbers, but a departure is made in the manifold from the straight-across tube. The riser from the carbureter leads to a Y, which has at the upper ends of the branches short risers. Each of these risers goes to a horizontal tube of smaller diameter than the Y. While the cylinders are cast in pairs, each has a feed lead from the horizontal tubes, with the riser for the forward tube central between feeds 2 and 3, and that of the rear tube between feeds 4 and 5. With a bore of 4 inches, the stroke being 5½ inches, the over-all cylinder measurement is 31½ inches, and the added clearance space 5¾ inches. The flywheel measures 18 inches, weighs 80 pounds and has its shaft running on ball bearings. Both systems of high-tension ignition are used. The speeds are three. The oiling system is simple in the extreme. Pressure from the exhaust is used to lift the oil from the crankcase to a cylindrical tank, on the dash which has just one feed to the crankcase for splash lubrication.

The Stoddard makes up one of a class of six in which the order of explosions is cylinder numbers 1-4-2-6-3-5, this being the largest order of the five orders at the show. It is reported, however, that it will be deserted by one of the six for an order of explosions not here, but which will be found in the A. L. A. M. show. The manifold is of the type where the feed from the carbureter leads to a horizontal tube, the ends of which open into a longer parallel tube, this having three leads, center and two ends. These three each run to a unit housing for each pair of cylinders in one casting. The cylinders of 4½ bore by 5 stroke occupy a space 36 inches in length, this compactness, for size, being maintained despite the fact that the shaft runs on ball bearings of the most liberal dimensions. For fan and other clearances there is added 7 inches. The 90-pound flywheel is 17½ inches in diameter and the forward speeds are three in number. Ignition is by either magneto or battery, both high-tension systems being the equipment. The Kinsey force feed oiler is used, but is removed from the dash to the motor frame on the left side over the rear side arm.

On the larger firing line, that is, the order of cylinders 1-4-2-6-3-5, is the American Mors. The cylinders are cast in pairs and the final gas feeds are three in number. To reach these three the manifold design commences in a diamond-shaped bit of piping. At the lower corner of the diamond is the riser from the carbureter, at the top is the feed to the central pair of cylinders.

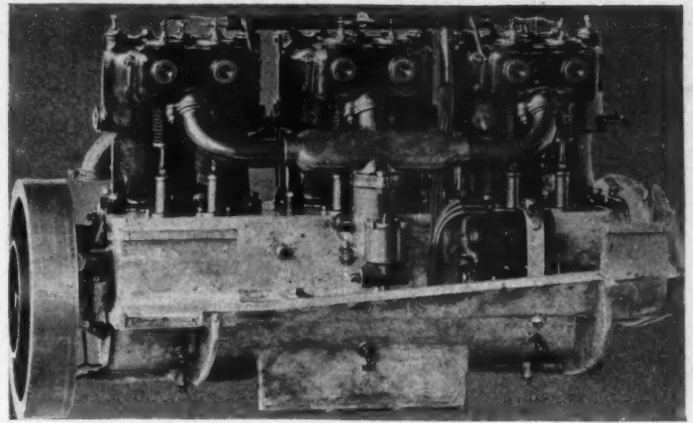


EXHAUST SIDE OF STODDARD-DAYTON SIX

From each side corner of the diamond a pipe is carried up diagonally, the line of obliquity in each case being the same as that side's lower line of the diamond, to a point in line with the valve ports, where it bends into a horizontal short length to its port in the particular pair of cylinders. The crankshaft bearings are plain other than the forward one. The overhead measurement is $37\frac{1}{2}$ inches and the clearance $7\frac{1}{2}$ inches. The cylinders are $4\frac{1}{2}$ bore by 4 stroke; the flywheel is 18 inches in diameter and weighs 96 pounds. Oiling is by a gear pump placed at the outside of the crankcase at the rear left corner and driven from the camshaft, the pumpshaft being vertical and the gears horizontal. The oil is taken from a basement in the crankcase, carried through a small and simple sight on the dash and then to the crank bearings by flexible tubing. Ignition is both high-tension magneto and battery. The speeds are three in number.

The Premier is one of the members of the majority order of cylinder number firing, the sequence being 1-4-2-6-3-5. The cylinders are cast in pairs and the valve housings, being on opposite sides the gas feed, are reduced to a simple expression. The forward pair are connected to the middle pair by a short pipe between, and the middle and rear pairs have the same arrangement. This gives a passage straight through that is not outside the cylinders, except in the two small connecting lengths above mentioned in the form of added piping as a manifold. The lead from the carbureter is equally simple, a riser going straight up to the cross passage between the middle and rear valve housings and a second riser branching off from this first to the cross passage connecting the first and second pair of cylinders. The close grouping of the cylinders requires but an easy angle to this second riser, doing away with an abrupt turn to check the flow of the gas in either riser. The cylinders are $4\frac{1}{2}$ bore, with the stroke the same, giving a total over-all cylinder measurement of $37\frac{1}{2}$ inches, with $6\frac{1}{2}$ inches added clearance between dash and radiator. The engine is balanced with a 90-pound flywheel of 18 inches diameter. Ignition is by the dual high-tension systems of magneto and battery, and lubrication is carried on by force feed through a Hill Precision oiler placed on the left side of the motor frame near the rear. Plain bearings are used on the crankshaft and three speeds are used.

The York Pullman also follows the practice of exploding the cylinders in the order of 1-4-2-6-3-5. The manifold is identical with that on the Marion; that is, the carbureter riser runs to a horizontal tube, which ends turn into a longer parallel tube, and this tube feeds at three points to a two-way branch to the separated cylinders. The across-the-head measurement is 30 inches, with a radiator to dash distance of 40 inches. The bore and stroke are squared at $3\frac{3}{4}$ inches. The flywheel scales $15\frac{1}{2}$ inches as its diameter and 65 pounds as its weight. The crankshaft runs on plain bearings and the engine is drawn on for three forward speeds at the gear box. The ignition is up to the minute in that not only is the coil and battery there for emergencies, but the high-tension magneto is regularly employed. Lubrication is by a McCord force feed oiler carried to the left of the carbureter, just back of the center and on the motor



INTAKE SIDE OF BERLIET SIX

framing where it is conveniently located and most accessible.

The National is the only instance in the show where two sizes of sixes are shown. The order of explosions is one of a second group of three makes, it being 1-3-5-6-4-2. The manifolds differ in each model only in the number of final exits, that of the smaller size feeding cylinders cast in pairs and that of the larger cylinders cast individually. The manifolds are of that design where the riser from the carbureter goes to a comparatively short tube, the ends of which turn into a longer tube. On the smaller model there are three exits from the long tube, one to each pair of cylinders, and on the larger model there are six exits, one to each cylinder. On the big six the over-all cylinder length is 39 inches, with 1 foot additional from dash to radiator. The cylinder measurements are 5 inches, both bore and stroke. The flywheel has a diameter of $17\frac{1}{2}$ inches and weighs 75 pounds. On the little six the under-the-bonnet measurements are 34 inches and 44 inches; the flywheel is 17 inches and weighs 65 pounds. The cylinder bore is $4\frac{1}{2}$ inches and the stroke $4\frac{1}{4}$ inches. Both models have ball-bearing crankshafts, there being seven races in the big and four in the little. In the matter of speeds three are held to in each model. Dual high-tension ignition and force feed lubrication are used, the description applying to either size car.

The Welch six belongs to the majority firing sequence; that is, 1-4-2-6-3-5. The manifold, if such it can be called, is an amplification of the Welch four-feed; that is, the carbureter feeds to a sort of reservoir that has parallel front and back sides, which in themselves are somewhat more than a quarter of a circle in segment. From the circular top side of this reservoir lead six pipes, each direct to its cylinder, although the cylinders are cast in pairs. The overhead cylinder length is 39 inches and the dash to radiator measurement is made considerably longer, its inches being $52\frac{1}{2}$. The flywheel is larger than generally found in motors having six cylinders, the diameter being 20 $\frac{1}{4}$ inches and the weight 167 pounds, this latter being the greater increase, even though the cylinders are $4\frac{1}{2}$ inches by 5 inches. The Welch drive is maintained of three forward and two re-

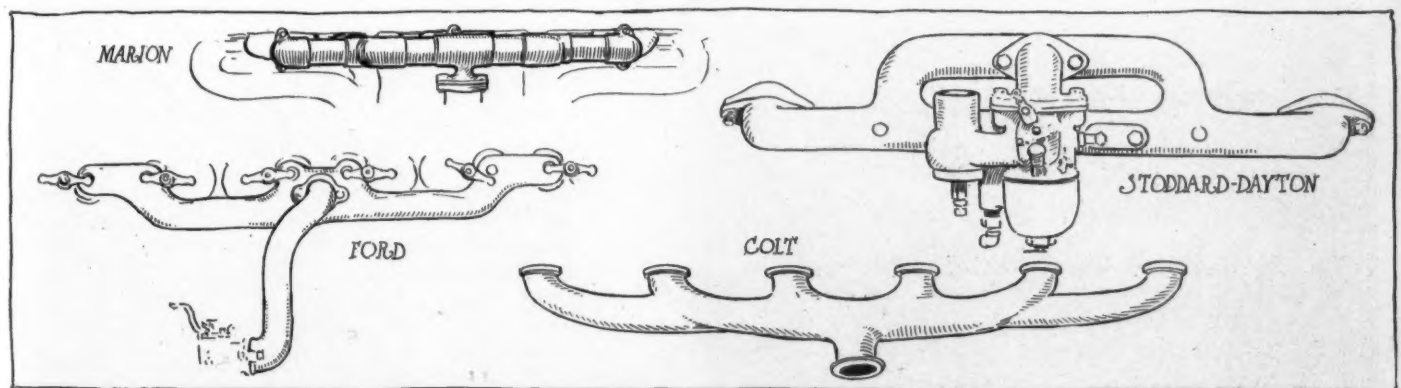
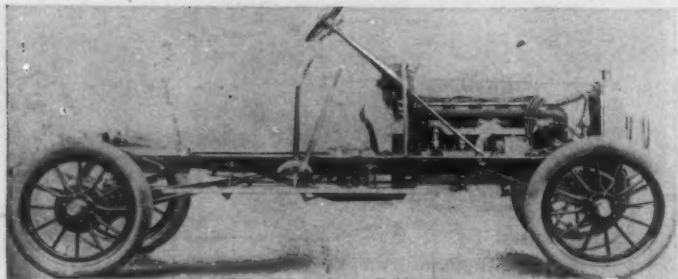


ILLUSTRATION OF SOME OF THE DIFFERENT IDEAS IN INTAKE MANIFOLD CONSTRUCTION



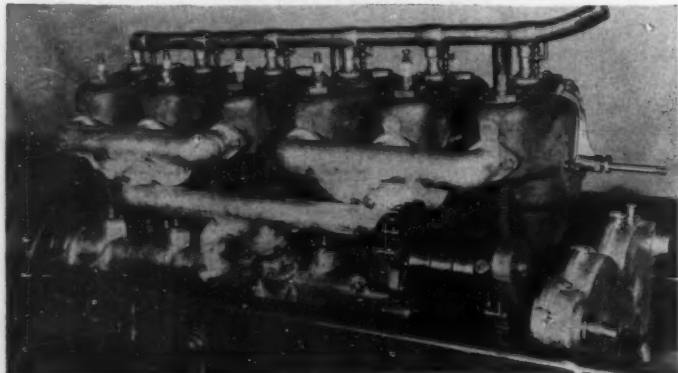
CHASSIS OF THE FORD SIX

verse. Ignition is by either high-tension magneto or by battery and coil. A Hill force feed oiler is used in connection with plain bearings along the crankshaft.

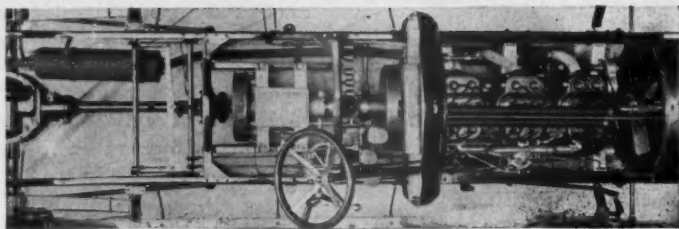
A member of one of the two orders of three examples each of ignition sequence is the Glide, the firing running 1-3-5-6-4-2, with a manifold of that design that first takes in the gas at the shorter of two horizontal tubes, which shorter tube leads, at its ends, into the longer tube, having three exits. These exits are not next in order direct feeds to the cylinders, but lead to two-way branches that run to separately cast cylinders. The bore of $4\frac{1}{2}$ inches—the stroke is 5 inches—gives a measurement along the heads of $36\frac{3}{4}$ inches and a bonnet opening 44 inches long. The flywheel comes down to six-cylinder proportions, as at present understood, it being $16\frac{1}{2}$ inches in diameter and $66\frac{1}{2}$ pounds in weight. The plain crankshaft bearings are directly oiled by a force feed lubricator.

The Colt is one of a pair that follow this order of firing: 1-3-2-6-4-5. Its intake manifold is designed with the evident idea that much fear of impoverishing the next intake is only a bugaboo too much believed in. It has a straight riser to the cross tube, giving a short-stemmed T design. The cross tube is not perfectly horizontal, but this is evidently due to needs in all-round design. Each of the separately cast cylinders has its own direct lead from the cross tube, although the flow to cylinders 3 and 4 has to take an acute angled turn, while the other four branches lead out at obtuse angles. The overhead measurement of the cylinders is a trifle longer than some other sizes of the same or nearly same bore, which is $4\frac{1}{2}$ inches—the stroke is 5 inches—this line reaching 41 1-3 inches, the added clearance coming up to 44 inches. In flywheel design one meets the lightest at the show—perhaps approaching the ideal in theory if no more—it being but 14 inches across and weighing only 32 pounds. Free feed oiling is used to the plain bearing crankshaft, which drives through a three-speed set. Ignition is as are all the others, by magneto and battery.

The Chadwick, which makes up a member of the pair having the order 1-3-2-6-4-5 of firing, also has in effect a T-shaped manifold, a strict geometric design being departed from at the center feed, there being three exits to cylinders cast in pairs. The arms of the T slope slightly upward from the stem and the center exit is raised as a short stem to the turn into the cylinder. The Chadwick has joined that group of makers which turn out sixes only, but keeps to its design of inclosing each



INTAKE SIDE ACME SEXTUPLET

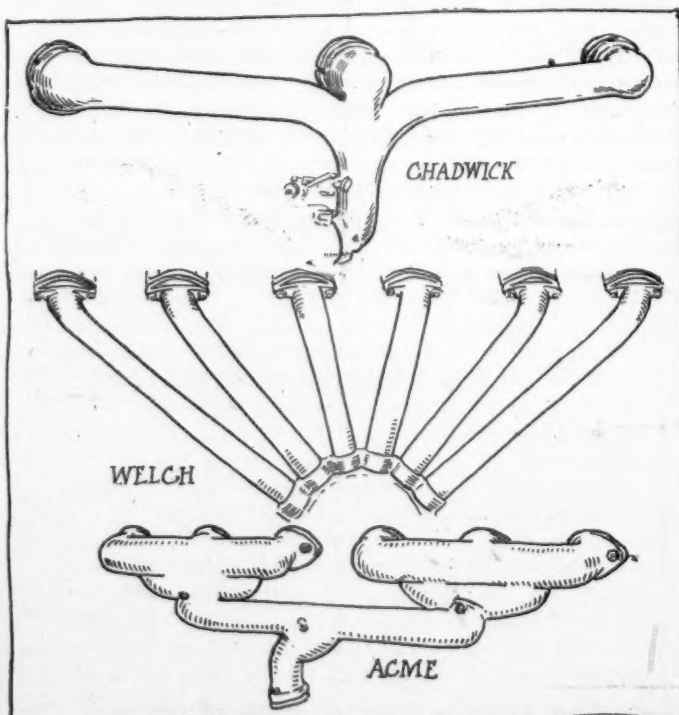


PLAN VIEW STODDARD-DAYTON SIX

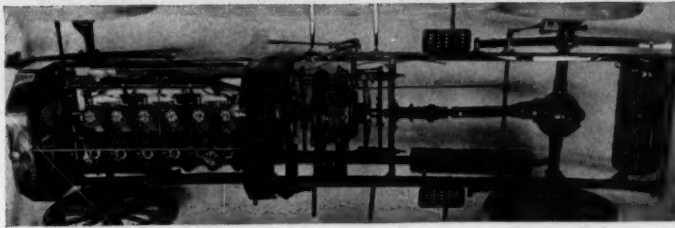
paired unit cylinder head and valve housing in a copper cylindrical jacket. This arrangement gives an overhead line 37 inches long, with bores of 5 inches—the stroke is the longest in its class, being 6 inches. The bonnet opening is long, being 50 inches, or 1 inch more than a foot added to the cylinder head line. A 19-inch flywheel is used weighing 96 pounds. There are four speeds. Ignition is by magneto and battery. Lubrication is through a force feed oiler to the plain bearings at the crankshaft of the motor.

The Gearless order of firing is another example of the 1-3-5-6-4-2 sequence. The manifold is of that type where the carburetor riser goes first to the shorter of two horizontal tubes, with its ends leading the longer parallel tube, and three exits from this to two-way branches to the separately cast cylinders. Each final of the two-way branch has its exit at such a distance that the length of flow is the same from the carburetor to all intake ports. The bonnet is notably long, the overhead cylinder line being 46 inches, and the dash to the radiator lacks 3 inches of being 5 feet. The cylinders have a bore of 4 13-16 inches and a stroke of $5\frac{1}{2}$ inches effective on a flywheel of 15 inches in diameter and 65 pounds in weight. But two forward speeds are used. Ignition is by high-tension magneto and by battery and coil. Lubrication to the plain bearings is by means of a gear pump in a sub-base on the crankcase; this drives the oil to a header tank on the forward side of the dash, where a 4-pound pressure is maintained. From the header pipes lead to the bearings and holes in the wrist pins to the crank checks and from here drip to the base and then to the sub-base of the engine.

The Austin has the prevailing firing order in the cylinders, being one of the six makes which ignite in the order of 1-4-2-6-3-5. The manifold commences as a long branched T, each branch curving up to a three-exit tube opening to the separately cast cylin-



CHADWICK, WELCH AND ACME MANIFOLDS

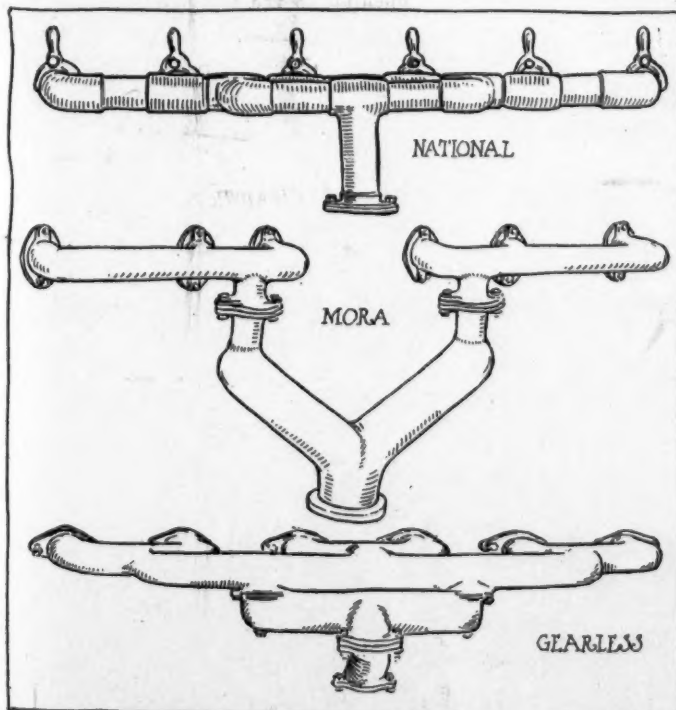


PLAN VIEW GEARLESS SIX

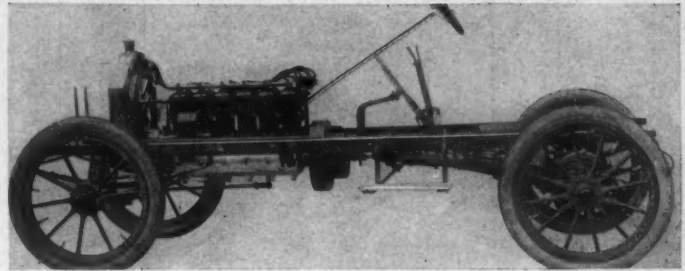
ders. In each of these latter two headers the opening into it is at the point under the central exit, that is, the exits to cylinders 2 and 5. The overall cylinder measurement is 45 inches and the under bonnet clearance length is 54½ inches. The fly wheel has a diameter of 20 inches and weighs 98 pounds. The bore and stroke are equal, the measurement being 5½ inches. The drive is through four speeds—and a reverse. Ignition is by both battery and magneto. The system uses force feed to the crankshaft bearings, which are plain.

The Frayer-Miller, while not making up a part of the floor exhibit, is used outside in demonstrations. Its order of igniting is like four others, being 1-2-3-6-5-4. The manifold is of that design which has the riser from the carburetor running to a cross pipe, the ends of which lead to a longer cross pipe having three exits. These exits then have T heads, the branches leading to the separately cast cylinders. Four speeds are used, with the power derived from cylinders of 4 1/16 inches bore by 5½ inches stroke. Ignition is by battery and coil, it being the only six-cylinder in the show that does not have tension magneto attached as regular. Lubrication is by force feed to the various bearings. The flywheel diameter is 20 inches and the weight 100 pounds. The length over all cylinders is 33 inches and the hood clearance 43 inches.

The Napier firing order belongs to the group of five which runs 1-2-3-6-5-4, and the manifold is also of that order, with the feed from the carburetor going to a cross tube opening at each end into a longer parallel tube which delivers at three points to the valve heads of the cast-in-pairs cylinders. The motor heads give an over all measurement of 42 pounds and the dash to radiator distance is 55½ inches. Oiling is by a gear pump placed outside the crankcase to the left and forward, taking the oil from a sub well on the crankcase. The cylinder bore is 5 inches and the piston stroke 4 inches. The fly wheel



NATIONAL, MORA AND GEARLESS MANIFOLDS



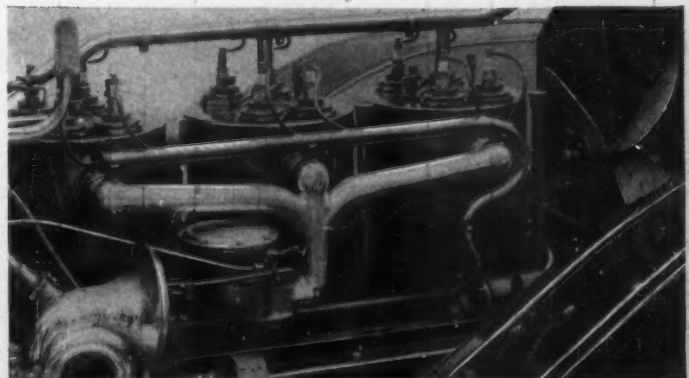
CHASSIS OF MARION SIX

has a diameter of 20 inches and a weight of 80 pounds with a plain bearing shaft driving to three speeds. Ignition is by a synchronized high tension system with magneto as an option.

The Berliet is an outside exhibit and includes its new six model. The order of firing is 1-4-2-6-3-5, being the same as the group of six makes at the show. The manifold is also of the type which starts with short right and left branches leading at its ends into a longer tube that exits at three points to the cylinders, which are cast in pairs. Oiling is by a gear pump, taking from a sub base oil reservoir, with the crankshaft running on balls. The speeds are four, with direct on both third and fourth. Ignition is by high tension magneto only. The bore is 4¾ inches and the stroke 5½ inches. The fly wheel weighs 85 pounds at 17½ inches diameter. The under hood clearance is 45 inches, of which 39 inches is taken up by the cylinder heads, the difference being nearly all forward at the fan.

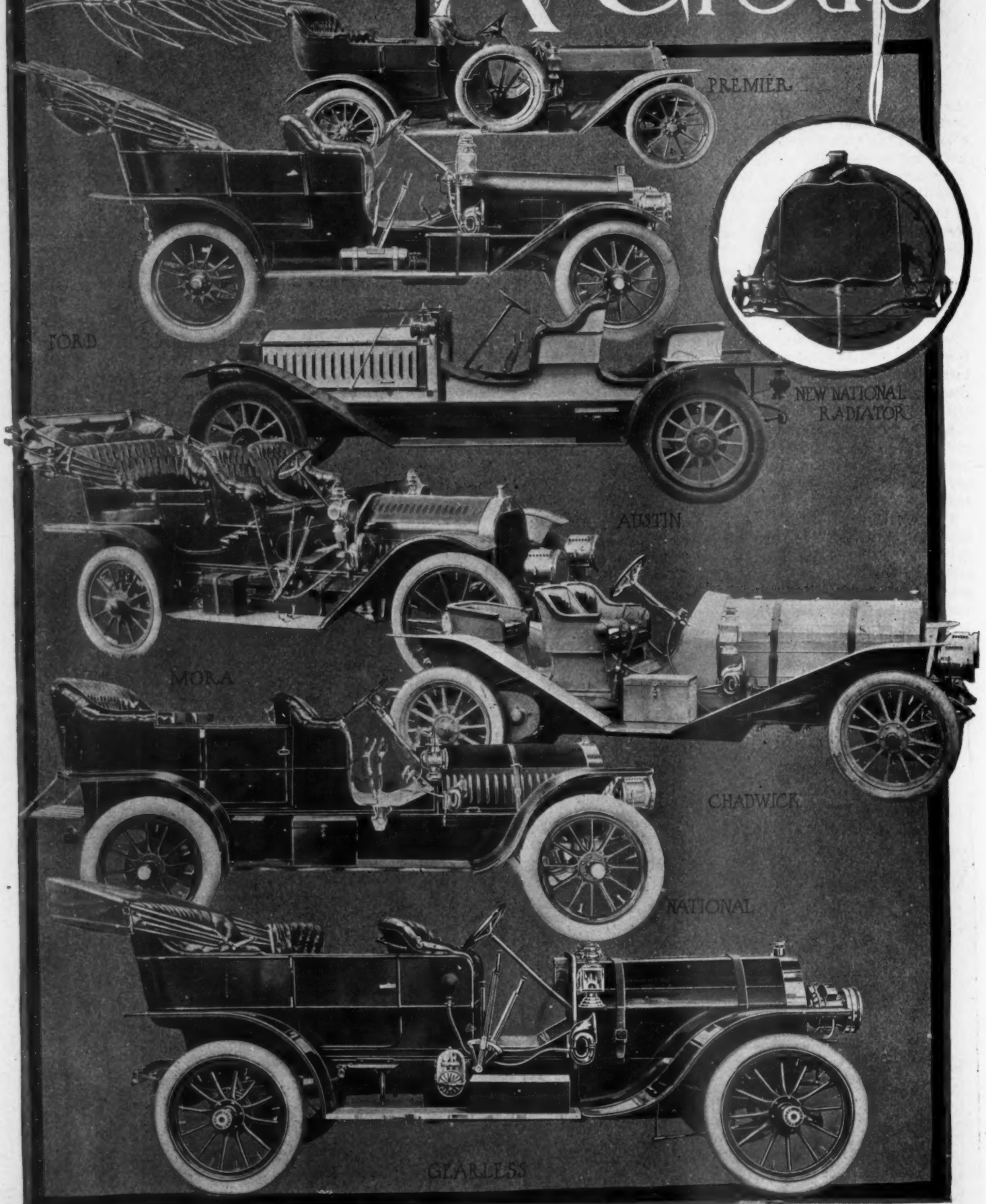
The Thor six standing alongside the Thor bicycle motor is all that would be expected of Thor products in the excellence of workmanship and finish. The order of explosion is 1-5-3-6-2-4, being the same as that of but one car in the show. The intake manifold branches Y-shape direct from the carburetor, the stems curving upwardly at their ends into a straight across tube that has three exits to the cylinders cast in pairs. The bore and stroke are 4¾ each and the crankshaft has ball bearings. The length across the cylinder heads is 40 inches. Ignition is by high tension magneto and a commutator is in place for coil and battery. The oil piping is arranged for any type of attached oiler. The fly wheel has a diameter of 18 inches.

The Trebert motors are shown in two models, one with head valves and the other with side valves. The order in firing in each is 1-4-2-6-3-5, that followed by the greater number of car makers at the show for any one system of firing. The intake manifold is also the same in each model. There are three openings from the carburetor head. These are combined in one union; the center one leads to the center pair of cylinders while the end pipes lead to their respective pair of valve housings, the cylinders in both models being cast in pairs. Ignition is by the double high tension system and the oiling is by a gear pump placed outside at the forward end of a sub-base oil reservoir to plain bearings on the crankshaft. The fly wheels are identical, being 16 inches in diameter and 75 pounds in weight. In the overhead valve model the bore is 4 inches and in the other it is 4½ inches. The stroke in each is 5 inches.



INTAKE SIDE OF CHADWICK SIX

A Group



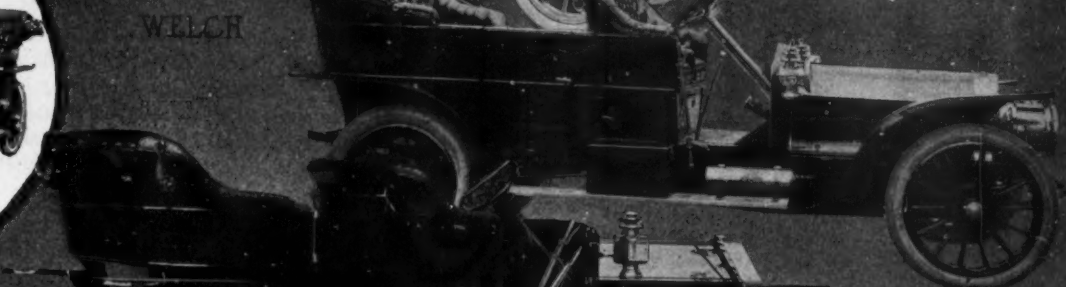
of Sixes



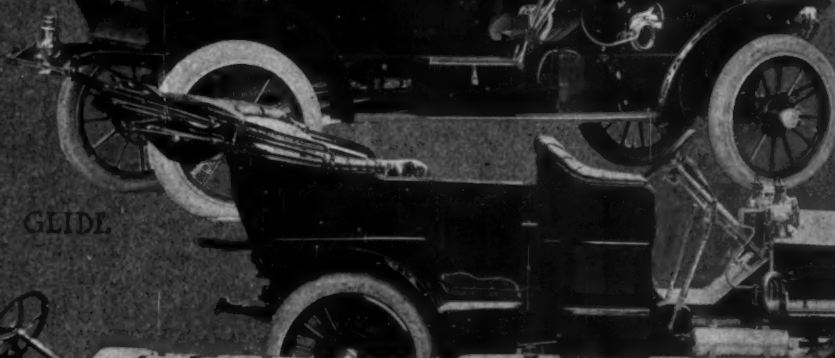
ACME



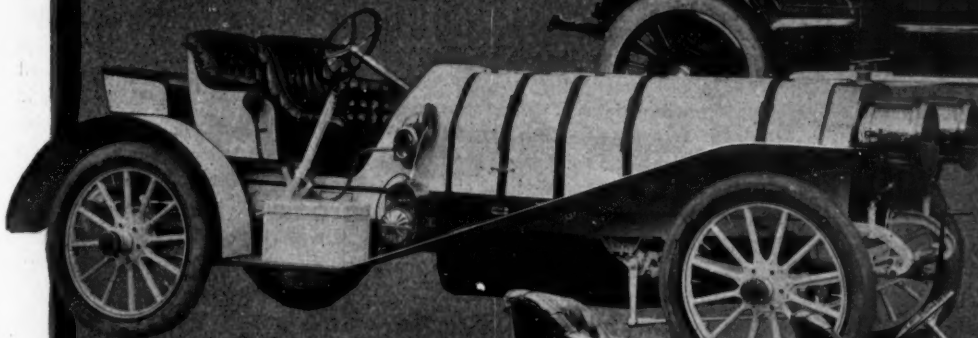
WELCH



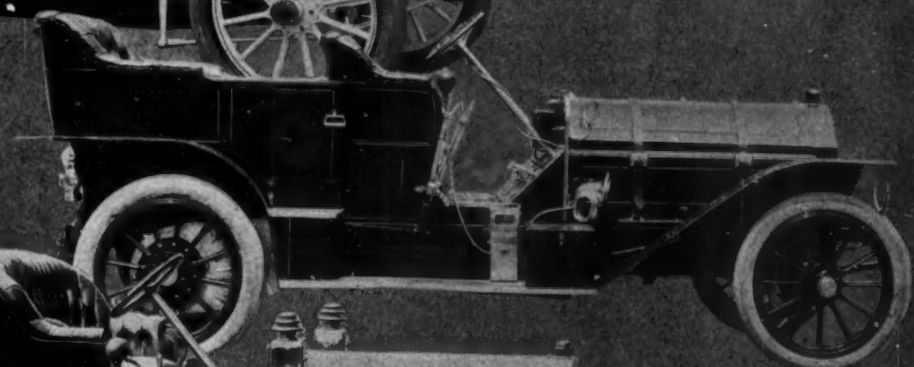
STODARD-DAYTON



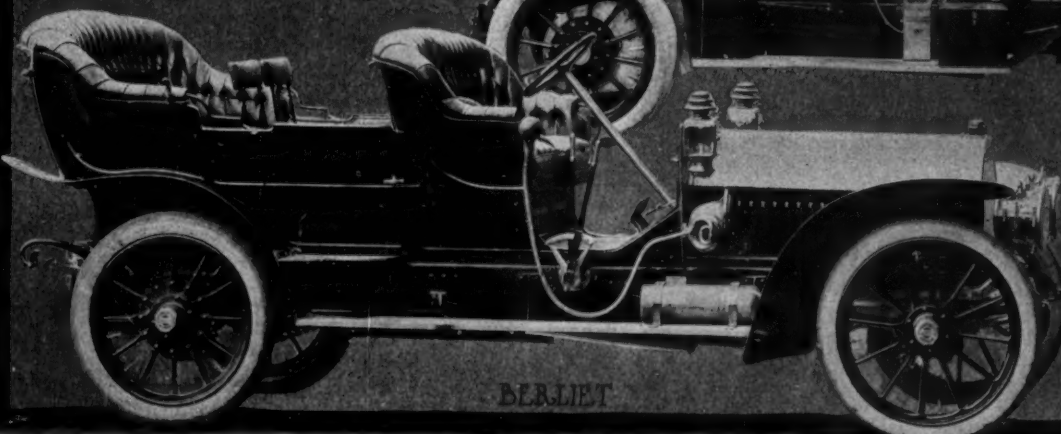
GLIDE



GLARLES



STODARD-DAYTON



CHADWICK

BERLIET



Some New Cars

OF THE new cars perhaps the Imperial roadster attracts as much attention as any, chiefly because of the double drop in its main frame, which has a drop of $5\frac{1}{2}$ inches in the rear of the front springs or adjacent to the dash and a drop of the same number of inches in front of where the rear springs shackle. This double drop is brought about in securing a straight-line drive, consisting in having a horizontal propeller shaft when the car is loaded. The motor and gearset are carried on a subframe which is on the same level as the dropped portions of the mainframe. In spite of securing a straight-line drive the car has a clearance of $10\frac{3}{4}$ inches and the body sits very low. The motor, rated at 35 horsepower, has cylinders cast in pairs, with valves on one side, the cylinder castings having integral valve chambers and waterjackets. A double ignition system is fitted, the leading one consisting of a geared Eisemann magneto on the right side, whereas the minor system is a storage cell with its necessary accompaniments. The carbureter is a Mayer, designed with a separate float chamber and heated by waterjacketing the mixing chamber. In the motor flywheel is a floating-ring clutch comprised of three bronze disks with cork inserts. Well placed between the clutch and rear axle is the selective gearset, offering three forward variations. In the propeller shaft are universal joints. The rear axle is a floating construction. Many accepted constructional ideas enter into the make-up of the running gear, a few of these being: Gemmer steering gear with stationary sector on the top of the pillar for carrying the spark and throttle controls, Fedders' Mercedes design of radiator, internal and external rear hub brakes—the internals metal-to-metal surfaces and the externals camel's-hair-lined bands clamping on metal drums—and the usual body equipment. The roadster is shown with single or double rumble or bucket seats. Front and rear fenders are very much alike, being a 45-degree part with a short curved end part over the top of the wheel. A short metal running board connects them. The radiator hangs in the rear of the front axle, the dash is a very small, straight, wood affair and the steering column is well inclined, the combination having a pleasing effect.

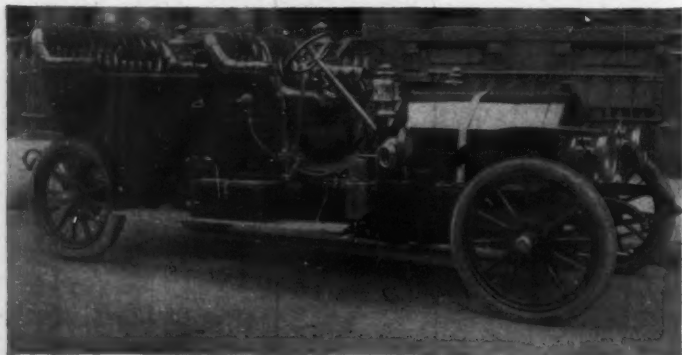
Atlas Cars with Three Types of Motors

One year ago the Atlas exhibit consisted of a small runabout the company was beginning to manufacture, but now, in addition

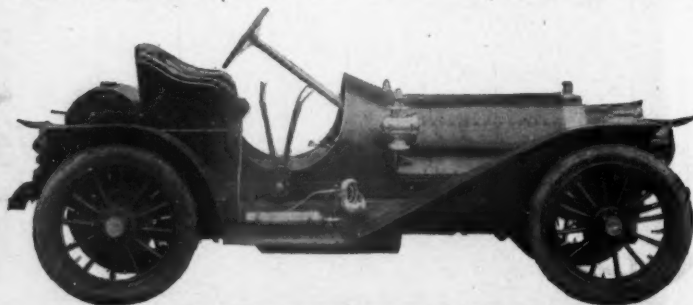
to this refined two-cylinder runabout, the company has a three-cylinder and also a four-cylinder touring car. In all three cars are used the two-cycle motors, in which the chief point of interest is that the mixture is taken from the carbureter into the crankcase, then enters the combustion chamber through ports in the piston, the mixture passing from the carbureter through channels in the side of the cylinders and thence through ports in the cylinder walls when the piston ports register with them. Also in connection with the motor is the throttless carbureter—one of the simplest at the show. In brief it is an elbow pipe through which the air passes and in which is the nozzle. On the steering wheel is a control for raising or lowering the needle valve in the spraying nozzle. At the air entrance is a butterfly valve which can be entirely or partly closed to facilitate starting, there being a rod connection from it to the front of the radiator. Also deserving of attention is the use of thermo-syphon water circulation, in which are used the largest diameter water pipes yet seen on a water-cooled motor. The pipe conducting the flow from the radiator base to the jackets is a variable diameter pipe, becoming smaller and smaller in diameter as it passes from cylinder to cylinder to the back one. The return pipe from the jacket tops to the radiator top has a similar gradation of diameter. The four-cylinder car, with cylinders cast separately and with $4\frac{1}{2}$ -inch bore and stroke, is rated at 46 horsepower. The clutch is a leather-faced cone, speed variations are through a three-speed selective set carried on Hess-Bright bearings and the drive is by shaft. The rear axle is a Weston-Mott construction, internal and external brakes are on the rear wheels, and springing is by means of semi-elliptics. The three-cylinder car is rated at 34 horsepower and has three-quarter elliptic springs but in all other regards follows the four-cylinder design. In the two-passenger roadster there is fitted a planetary transmission with multiple disk clutch.

Marion Company Makes Roadsters Only

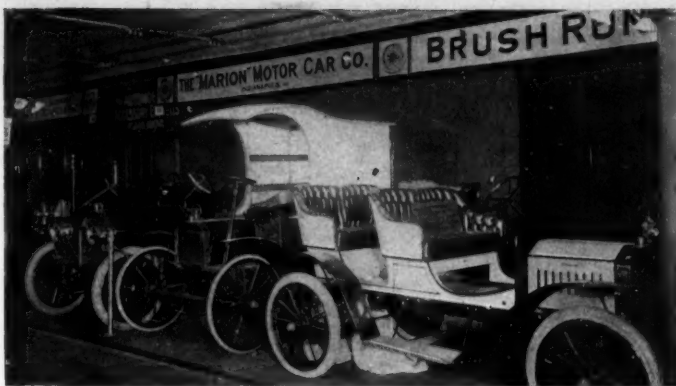
The popularity of the three or four-passenger roadster is exemplified by the number of chassis with this style of body attached, but only a few concerns are manufacturing cars of this class only. In this category is the Marion concern. The Marion roadsters are, in brief, four-cylinder constructions, with multiple disk, flywheel clutch and rear axle selective gearsets. The Reeves motor used with four separately cast cylinders and valves on opposite sides has a rating of 22-24-horsepower, the bore and stroke measuring 4 inches. Half-time gears on the forward end are enclosed and run in oil;



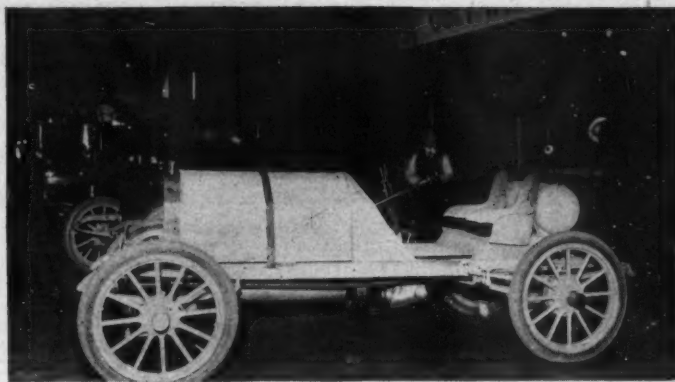
ALLEN-KINGSTON TOURING CAR



FOUR-CYLINDER NATIONAL ROADSTER



BRUSH IN TOURING GARB



MUCH TALKED ABOUT COLT

the timer is on the top of a short vertical shaft at the front, taking its drive from the right camshaft. On the front end of the left camshaft is carried the gear water pump. Because of carrying both of these motor accompaniments in this manner a lay shaft is not required. The cylinders are ground internally, the crankshaft is a ground-all-over forging with an integral flange for attaching the flywheel; bearing surfaces are die-cast interchangeable bushings, pistons carry eccentric rings, one-piece interchangeable valves are ground all over; valve-lifters carry case-hardened rollers on their lower ends and carry adjusting means; brass water connections are furnished and in the cause of accuracy of construction and interchangeability, all parts are made on jigs and templates. In the flywheel is the multiple-disk clutch with twenty-nine steel disks arranged in alternate sets of fourteen and fifteen to a set, all operating in oil and engaged by a large-diameter involute spring and disengaged by a spring action in the disks. The selective gearset, called the Stutz, after its designer, is carried on the front of the rear axle. In brief it is a selective set giving two forward speeds and a reverse. The gears are nickel steel and shafts are carried on Hess-Bright bearings. As in the majority of cars using a rear-axle gearset, the drive-shaft is encased in a tubing which forks at its forward end and finds support from a crosspiece of the car frame, there being a universal joint in the drive-shaft so that its axis corresponds with the support of the yoke. Formed integrally with the gearcase housing is a ring part in which is carried the differential gears. This ring part is like a short drum without ends. To form the ends are two plates which belt in place and have tubular parts for taking the axle tubes. Internal and external brakes are mounted on the rear wheels, one set for regular use, the other for emergencies. In the running gear are tubular or I-beam front axle with a 3-inch drop, worm and segment steering gear, 12½-gallon gasoline tank, 11¼-inch clearance, ball bearings in the front wheels, and semi-elliptic front springs and full elliptic scroll designs in the rear.

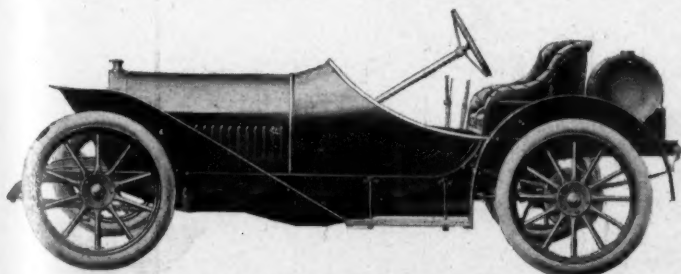
Kiblinger in the Field with a Buggy

This year marks a more determined invasion of Gotham by the Holsman or buggy class of light car. Last year one of this style vehicle was on exhibition; this year there is a whole colony of them in the west end of the balcony and many and varied is the design in them. Of these the Kiblinger is a newcomer. It is a two-cylinder air-cooled 9-horsepower buggy with 3¼ by 3¼-inch cylinders, placed lengthwise under the body amidship. The design is not new in that

the two-speed planetary gearset is supported on a continuation of the crankshaft and power transference is by single chain to a jackshaft, thence by side chains to the back wheels, the first reduction being from ten to thirty-tooth sprockets and the second by eighteen to forty-tooth sprockets. Cooling the cylinder walls are integral flanges circling the cylinder and in the cylinder head are radiating flanges. Intake valves are automatic and the exhaust is opened from a camshaft carried in the top of the crankcase. The spark plugs are located between the intake and exhaust valves. Oiling of the motor is through a four-feed Essex oiler with leads to the cylinders and connecting rods. Mixture is supplied by a Kingston carburetor. New in the cooling are two small four-blade fans which operate in a plane parallel to the cylinder bore and force an air current onto the chamber carrying the valves and also onto the cylinder heads. These fans are driven by a round leather belt passing over a groove in the flywheel. Steering is by tiller or hand wheel and brakes are on the rear wheel. The control consists of a side lever for direct drive and pedals for reverse, low speed ahead, brakes and carburetor control. The gasoline capacity is 4 gallons and road wheels are 38 inches in diameter.

Carter Uses Two Air-Cooled Engines

No greater novelty exists in the entire show than the two-engine Carter, in which are placed two 24-horsepower air-cooled Carrio motors side by side under a forward bonnet. Each motor has its own intake pipe, its own carburetor, its own ignition system and starting crank, and on the rear end of the crankshaft of each is a leather-faced cone clutch. The clutch shaft is continued and on each is a sprocket for a Morse silent chain which connects with a single shaft coupling with the three speed and reverse sliding gearset. On the car footboard are two clutch pedals and in front of the bonnet are two starting cranks. The idea of yoking two 24-horsepower motors instead of placing a single motor of double the horsepower is that on ordinary running only one of the motors is in use, the other being idle. When a heavy hill or mud road is encountered the second motor can be switched in. In starting the motor both clutches are disengaged and held there by latch lockers on the clutch pedals. To start the motors the right one is cranked and when it starts it revolves the male part of clutch of the other, leaving the



NEW DRAGON ROADSTER



GARFORD'S LATEST PRODUCTION



HATFIELD'S MOTOR BUGGY

crankshaft of the second motor dead. To start the car it is only necessary to engage the one clutch when the drive is transferred through the Morse chain to the transmission shaft and thence through the gearset and to the rear axle. On this drive the male portion of the clutch in the second motor is operating. To cut in the other motor the driver has but to switch the current on at the steering wheel and operate the second clutch. When driving, if occasion called for it, both clutches could be disengaged at once. The timers on the two motors operate simultaneously through the same control lever and both carbureters are set to the same adjustment. In mounting the two motors a longitudinal center piece of the frame is positioned to receive the left arms of one motor and the right arms of the other, the opposite arms of the motors resting on the side pieces of the car frame. The transmission set operates on the straight sliding principle, having three forward variations and final drive is by shaft to a floating rear axle. The first model of these cars was put on the road in April.

Colt Runabout Makes Its Bow

In spite of skepticism expressed in some quarters the Colt six-cylinder car is in place and demonstrators are on the street. This car sets the low-water mark for six-cylinder construction, practically cutting the other lowest priced sixes in half. In brief, it is a clean cut two-passenger roadster with single seats and transverse cylindrical gasoline tank back of the seats. The motor, with six separately-cast cylinders having valves on opposite sides, intakes on the right, is a most conventional design and has a two-piece crankcase with the seven bearings carried in the upper half. Half-time gears at the forward end are enclosed; on the right front motor arm is a Bosch magneto, gear-driven; mixture is furnished from a Breese carbureter, lubrication is by a multi-feed Hill oiler and water circulation is provoked by a gear pump. Water piping is standard in every respect and the motor is carried through four integral support arms on each side. The flywheel carries a leather-faced cone clutch and in the rear of it is a selective gearset with three forward variations and one reverse. The transmission is a Warner design. Drive is by cardan shaft to a ball-bearing rear axle. Carried on the rear road wheels are two sets of brakes, internals and externals, one for regular use and the other for emergencies. The forward axle is a dropped tubular member. The frame is a pressed steel construction with subframe to take the motor and transmission support and springs are semi-elliptics. Regular equipment includes Michelin tires 34 by 3½ inches with standard clincher or detachable rims and the wheelbase measures 105 inches. The horsepower is placed at 40-50 and the bore and stroke of the cylinders measure 4½ and 5 inches respectively. The gear ratio on the back axle at two and one-half to one gives a 60-mile an hour speed. The gasoline tank has 25-gallon capacity and the finished car tips the scales approximately at 2,000 pounds.

This is the first public appearance of the car and naturally it was an object of interest to the critics at the show.

Nothing Untried in the Allen-Kingston

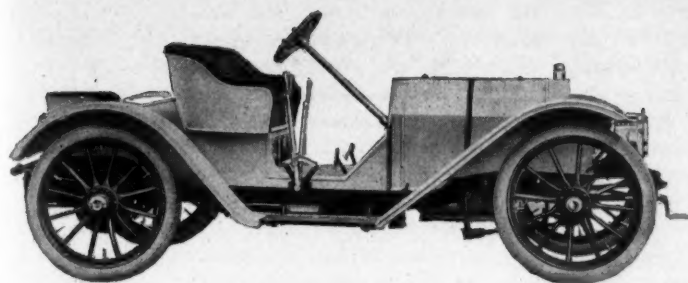
The Allen-Kingston, making its initial bow at a Gotham show, is new in name but not in principles, for the company calls attention to the fact that its aim in design has not been to place some radical innovation on the market but rather to pick the best out of foreign and American cars and unify them into the most symmetrical whole. Consequently it is not surprising to see points of construction copied from well-known American builders and side by side with these points taken from the workshop of the foreigner. All through there is nothing untried. Foremost in the chassis design is the mounting of the motor and selective gearset on a very stiff channel steel subframe of such rigid proportions that these parts could be mounted on this frame before it was placed on the mainframe. The mainframe, in keeping with this tendency, has the side members of great vertical depth and they are dropped 3½ inches in front of the back axle. Springs, semi-elliptics in front and rear, are 2 inches wide and 40 and 52 inches long respectively and the forward axle is an I-beam design. The motor carries those American earmarks of casting cylinders in pairs and placing the valves side by side in the bottom of integral ports or chambers on the left, the operation necessitating the use of but a single camshaft within the crankcase. Its rating of 40-45-horsepower comes from four cylinders with 5-inch bore and 5¾-inch stroke. Two ignition systems are fitted, one a Bosch magneto, the other a battery and distributor, there being two sets of plugs. Mixture is produced by a Mayer carbureter and in the motor cooling is a square tube radiator with pump. On the flywheel is a three-disk clutch with cork inserts. The transmission gives four forward variations with direct drive on the fourth. All shafts in it as well as all parts of the machine except the motor are carried on F. and S. ball bearings. Three brakes are fitted, one acting on a 12 by 3-inch drum on the drive shaft and a pair of 18 by 2½-inch drums on the rear wheels. The motor lubrication is an enclosed crankcase system with a basement portion to the lower half of the crankcase and a gear pump for delivering the oil from this to all of the motor bearings and the upper portion of the crankcase base, where it forms a splash.

Klink Is of Conventional Construction

The Klink car in runabout and touring car styles shows one more example of conventional construction—a four-cylinder motor, a cone clutch, sliding gearset, shaft drive and ball-bearing back axle. The motor, with cylinders cast in pairs, cast water-jackets and mechanical valves opened by one camshaft, enclosed within the crankcase, has cylinders with 4¼-inch bore and 4¼-inch stroke, the rating being 30 horsepower. The igniting current comes from storage cells and follows the conventional course of four-unit coil, and timer. A Schebler carbureter is in place; the lubrication means are contained within the crankcase by making the lower half of the case with an oil basement, from which a gear oil pump forces the oil to all of the motor parts. Cooling is by a forced water system. On the rear wheels are internal and external brakes, applied by long equalizers, which reach from side to side of the car and work through slots cut in the side pieces of the frame—Peerless and Pierce fashion.



OVERLAND FOUR-CYLINDER CAR



CURVED FRAME IMPERIAL ROADSTER

The front wheels are carried on Timken rollers and the rear axle is of the Standard roller bearing construction.

New Cleveland a Departure from 1907

The discontinuance of the Garford chassis by the Cleveland company demanded the production of a new chassis by this concern, which is doing its work in Milwaukee, Wis. The new car differs decidedly from the old. First, it has high-tension ignition instead of a make-and-break and has a multiple-disk clutch carried in a forward compartment of the gearbox as well as a selective gearset, giving four forward changes with direct drive on the third. Shaft drive, with a floating ball-bearing rear axle, remains. The motor, a Continental design, has the cylinders cast in pairs with valves on one side, double ignition with current provided by either magneto or storage cell and mixture furnished by a Schebler carbureter. The multiple disk clutch differs from all others at the show in that its fifty-one disks are not plane surfaces. One set of disks has its inner portion coned and the other set has its outer portion coned so the engaging surfaces of the disks are angle surfaces at approximately 45 degrees. The vertical surfaces of the disks do not engage at all. A center spring engages the disks, which operate in oil. The gearset has a nickel and vanadium combination steel in its shafts and gears and F. & S. bearings carry both shafts. On the drive shaft in the rear of the transmission is a large-toothed wheel into which works a sprag for holding the car on a hill should the brakes fail, the sprag being spring-engaged through a lever on the dash. Brakes are two sets, both internals in the rear wheel drums, one set acting in a 13-inch diameter drum and the other within a 16-inch drum. The friction surfaces in both are manganese bronze to steel. A feature in the car is a double clutch disengagement connection so that should the pins shear off attaching the clutch pedal to its shaft there is a separate linkage connecting with the emergency brake lever by which the clutch could be operated. The side pieces of the frame are arched over the back axle. Steering is through a worm and nut gear and a Mayo radiator is in place.

New Ideas Seen in the Jackson

Not content with its old two-cylinder models and its four-cylinder designs the Jackson company has added a 35-40-horsepower model with separately cast cylinders with $4\frac{3}{4}$ -inch bore and 5-inch stroke and having valves mounted in the cylinder heads—Welch fashion—intakes on an angle at one side and exhaust positioned at a similar angle on the other side. The camshaft lies along the cylinder heads and is driven by a vertical shaft rising in front of the first cylinder. The gears driving this vertical shaft from the camshaft as well as those transferring its drive to the camshaft are enclosed. There is a rocker arm for the operation of each valve, which arm is nearly encased in a cover for housing the camshaft over each cylinder head. On the outer ends of the rocker arms are rollers for bearing upon the tops of the valve stems. Of still further interest is the encasing of the flywheel with its multiple disk clutch and having the flywheel housing forming a connecting link between the motor and gearset so that the two are practically a unit. Besides being a unit they are carried on a three-point suspension in that the motor is supported through a transverse arm near the center of the crankcase at each side with the third point of support on a cross member of the frame

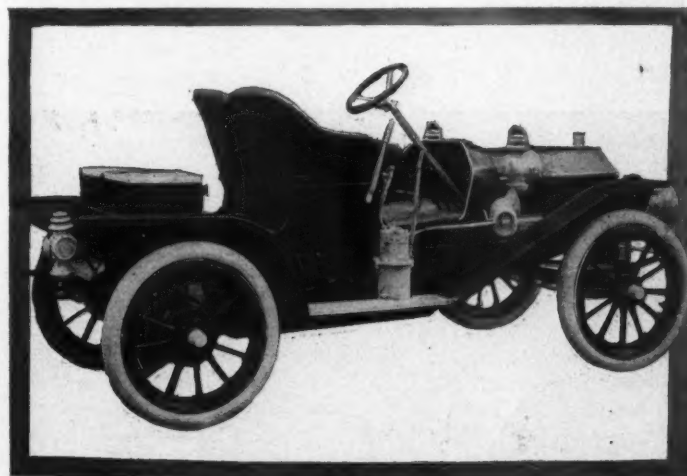
in the rear of the gearset. The gearset is a selective unit with three forward variations, all commanded by one lever working in an H slot scheme.

Overland, Using Planetary Transmission, Has No Levers

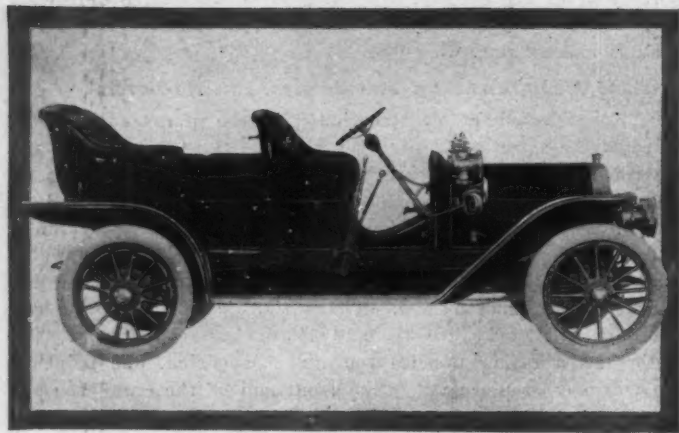
"A neat runabout construction" is the phrase frequently heard in the space containing the stripped Overland chassis and the runabout. Like many other new models or new makes on exhibition, it does not combine any innovations of a radical nature. To introduce it: There is in its make-up a four-cylinder motor with separately cast cylinders having integral valve chambers on the right, in the floors of which are placed the intake and exhaust valves. The rating is 22-horsepower and the bore and stroke are $3\frac{1}{2}$ and $4\frac{1}{2}$ inches respectively. The motor has a rather novel three-point suspension, one point on the frame cross piece under the front end of the crankcase and two others near the rear corners of the crankcase which are not on a cross piece of the frame nor on the side pieces of the frame, but on angle braces extending from a cross member to the side pieces. The supporting arms on the crankcase angle rearward, leaving the complete motor side well exposed. The flywheel has fan blade spokes and the two-speed planetary gearset is housed in a tubular extension on the front of the differential casting on the back axle, the car being one more example of the rear axle transmission. The gearset and bands are entirely enclosed and from external appearances the observer would be pardoned for concluding that the car had a sliding gearset. Control is without side levers, there being three pedals. The right one when pushed forward gives low speed and when pushed back puts on the reverse; the center pedal is for high and the inside one for the brakes. Springs in front and rear are semi-elliptics. The motor equipage includes jump spark ignition, water cooling and splash lubrication.

Many New Points in the Rainier

The Rainier radiator is the only relic by which the 1908 chassis could be recognized from the 1907 product. Like the Cleveland, the 1908 Rainier is a home-made product in that it is not a Garford chassis as formerly but a product of the Rainier factory at Saginaw, Mich. The ear mark of the car is a motor with low-tension ignition and selective transmission gearset, the gearset having four forward speeds with direct drive on the third. The motor, rated at 45-50 horsepower, has cylinders cast in pairs with opposite valves and make-and-break parts over the intake valves. The new make-and-break parts are different from anything previously seen. Lying along the side of the valve chambers is a horizontal ignition camshaft fitted with four cams, one for each cylinder. In a cage on top of the valve chamber is a bracket with a horizontal plunger which the cam strikes upon and pushes inwards. On this plunger are two flanges, between which is an arm on the rocking electrode, so that as the plunger is forced in it rocks the electrode. The cams are detachable from the shaft, being clamped on, and in case the timing has to



NEW MODEL REO ROADSTER.

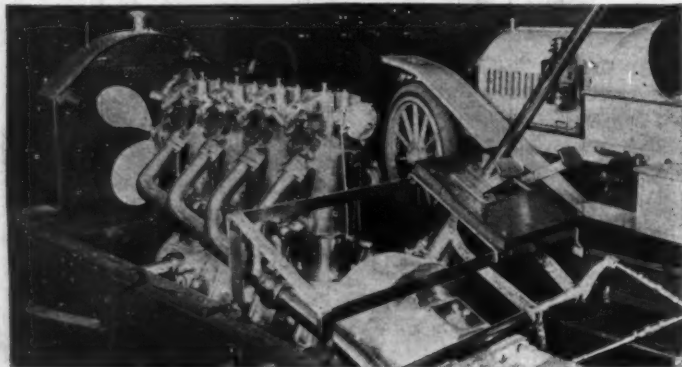


MARMON CAR, A WATER COOLER

be adjusted it is but necessary to loosen the cam, turning the marked flywheel to the firing point of the cylinder under question and turning the cam until a sharp cut-away part of it rests on the plunger. Then tighten it. The motor cylinders have a bore and stroke of 5 and 5¼ inches. The cylinders are ground interiorly and current comes from a Bosch magneto. The exhaust manifold on the left is a one-piece casting fluted to assist in heat radiation. Oiling is by a multi-feed McCord oiler and the mixture is made by a new design of Rainier float-feed carbureter. The motor crankcase is cast with webbings between the support arms. The clutch has alternate bronze and steel disks, the gearset is designed with its shafts carried on ball bearings and one above the other. The rear axle is a floating ball-bearing design and brakes are two sets of expanding members carried in rear wheel drums. A three-part platform spring carries the rear of the chassis, the spring being attached at its center to a peculiarly rearwardly arched cross member of the frame. The side pieces of the frame, it is apparent to the observer, are also dropped in front of the back axle.

Innovations Seen in the Ellsworth

As one car enthusiast expressed it when looking for the first time over the Ellsworth car: "Things are pretty much turned around and mixed up," so does the motor car observer express himself after having made a thorough study of the new Ellsworth. The Ellsworth is a four-cylinder chain-driven car with selective gearset and a double high-tension ignition system. But as to the turned round parts? First, the carbureter, magneto and timer are carried on a horizontal shaft in the hollow dash, which has a glass side next the driver, making it possible for him to see all the operations of these parts as he sits in his seat. Then the multi-feed oiler is carried at the front of the crankcase under the starting crankshaft so that when viewed from in front the oiler is visible beneath the radiator with its oil ducts exiting from each end. The large gasoline tank is carried under the chassis frame in front of the rear axle; the water pump is at the left front of the motor, being driven from a transverse shaft, and the camshaft lies along the cylinder heads and operates



MOTOR OF NEW FOUR-CYLINDER JACKSON

rocker arms for opening the intake and exhaust valves, which are located oppositely in the tops of integral valve chambers in the separately cast cylinders. Not only are the bearings for the overhead camshaft enclosed but housings entirely encase the valve rocker arms, so all the observer sees is a roughly diamond-shaped housing over each cylinder head, in which are the valve rocker arms and the camshaft bearings. The camshaft by this enclosing process is enabled to run on ball bearings in oil. Inside the motor matters are also a little mixed, for instead of a one-piece crankshaft there is a built-up construction carried on ball bearings. The intake manifold is a horizontal pipe hugging the valve chambers with a T connection to each chamber and at the front end of the manifold is a globular chamber forming a mixture cushion. The clutch is fashioned after the Mercedes in that there is a hardened conical drum attached to the driven shaft and a conical spring to the driving shaft and that with clutch engagement the spring winds up on the drum. From start to finish, including the crankshaft and camshaft, the car is a ball-bearing proposition and the utmost care has been expended on the selection of the material in the various parts of the car as well as on the preparation of it. The springs are full elliptics in the rear and semi-elliptics in front, and instead of hinging the long leaves at their ends they lie flat against each other and are fastened together by a large rivet. The spring then looks like two flat leaves which are riveted together at their ends and then separated at their centers until they assume the general full elliptic shape. The front springs are three-quarter elliptics, made the same way. Brakes are on the jackshaft and rear wheels. A novelty on the steering gear is the doing away



TWO STANDS SHOWING MOTOR BUGGIES

with the swinging throttle and spark levers on the wheel and the substitution of four cross rods beneath the front of the steering wheel, each rod being in length equal to the diameter of the wheel. On each rod's center is a toothed rack that works in a gear through which are connections to the parts to be controlled. When varying the throttle one rod is pressed endwise and to counteract the work it is moved in the opposite direction. The steering wheel is a steel construction. Axles in front and rear are I-beam constructions. Viewed as a whole, the Ellsworth car is the novelty study of the show, not because of radicalism but what may prove desirable innovations.

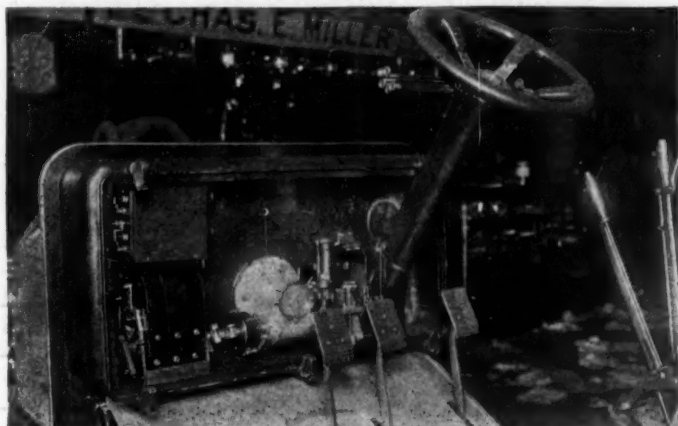
Two Camerons Shown, Both Air-Coolers

The two Cameron cars, though late in arriving at the show, attracted attention after their arrival owing to the fact that they are light air-cooled machines that have shown up well during the last year. The motor is a four-cylinder design with a 16 horsepower rating and with 3½ and 3¼-inch bore and stroke respectively. In the motor flywheel is a leather-faced cone clutch but the remainder of the transmission parts is housed in the differential casting on the rear axle, a jointed propeller shaft coupling the clutch with the transmission. Motor ignition is by dry cells with unit coil and distributor; lubrication is by an Essex pressure oiler with combined plunger oil pump, and cooling by integral flanges on the cylinders, assisted by fan.

Double brakes are carried on the rear wheels and they are expanding metal-to-metal brakes and clamping leather-lined bands. The spur gear transmission consists of a cross shaft paralleling and above the rear axle. On this shaft is a three-stage gear—a gear having formed integrally in it three spur gears of different diameter, placed side by side. The differential carries a spur gear for meshing with any one of the gear faces on the three-stage gear. To mesh the three-stage gear with the differential bevel the former can be slid on its shaft and the shaft rocked into mesh with the differential spur. Drive from the universal jointed propeller shaft to the short cross shaft carrying the three-stage gear is by bevels. Characteristic in the motor is mounting the valves in Frayer-Miller fashion in chambers over the cylinder heads and opening them by long vertical rocker arms rising by the cylinder sides, the top end of each rocker arm bearing upon the head of the valve stem and the bottom resting at the side of the camshaft so that the cam pushes it outwards when it is in action.

Dragon Company Has a New Roadster

The Dragon company is out with an entirely new roadster car which has a new motor fashioned after the 120-horsepower motors that the company constructed for the expected Vanderbilt cup race this fall. It is a new design of two-speed sliding transmission carried in the forward part of the differential housing. The 35-horsepower motor has cylinders cast in pairs, with valves on one side, the cylinders having bore and stroke of $4\frac{1}{2}$ inches. Incorporated in the car are a frame dropped in front of the back axle, ball-bearing transmission, roller bearing rear axle, I-beam front axle, metal-to-metal internal and external brakes on the rear wheels, and storage battery ignition. The body has very

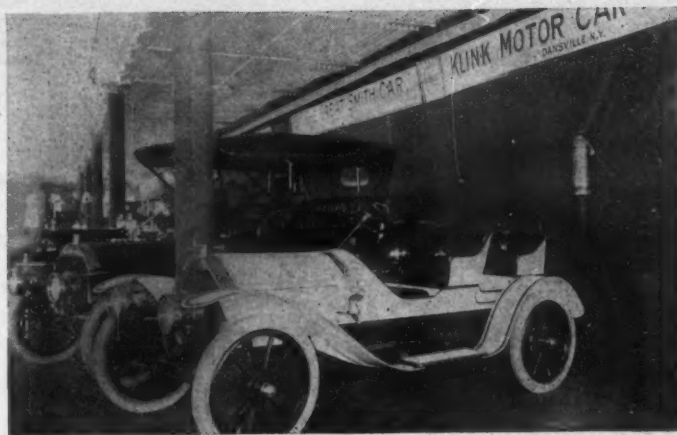


ELLSWORTH DASH, SHOWING LOCATION OF MAGNETO

racy lines, due to carrying the radiator in the rear of the front axle, placing the driver's seat over the rear axle and carrying a large cylindrical gasoline tank crosswise in rear of the seat. The Dragon company has aimed at startling effects in the color line. There is a five-passenger touring car of a rich cream color, handsomely striped with brown. The upholstery is of brown leather. The car has a touring top and a full equipment of lamps. The company also shows a new roadster with a red body with small black stripes and handsome brass trimmings.

Garford Car in Its New Form

The Garford car, though new in name, is not new in principle and the motoring public during the last few years has learned to know every part of it, as it was the chassis used by the Rainier, Cleveland and Studebaker concerns, the last named company still retaining it for next year. Of course, like all other makes, it has been refined and improved in the last 10 months and generally whipped into 1908 form. The chassis is made in 30 and 40-horsepower sizes, the former for five-passenger bodies and the latter for seven-seated bodies. The smaller has $4\frac{1}{8}$ by $5\frac{1}{4}$ -inch cylinders. The car has cone clutch, progressive sliding gearset, shaft drive and make-and-break ignition, with current from a Simms-Bosch magneto. The 40-horsepower motor has cyl-



RAKISH-LOOKING KLINK TOURABOUT

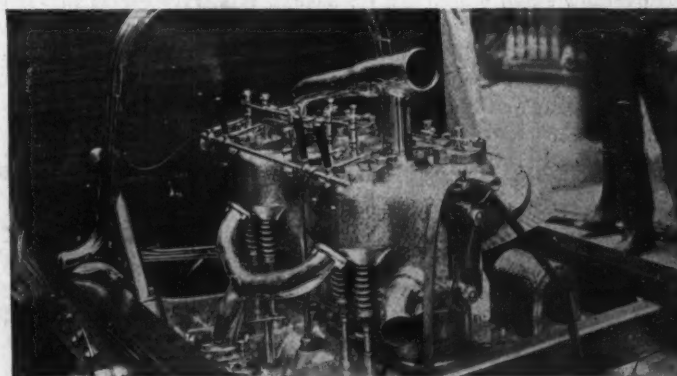
inders cast in pairs with valves opposite and on the tops of the intake valve chambers are the mechanisms for the make-and-break spark. The exhaust manifold is a one-piece affair fitted with fluted corners for heat radiation, the water pump is centrally placed on the exhaust side, and on the intake side are carbureter and magneto. The radiator fan is belt-driven, on the cylinder casting heads are aluminum waterjacket plates; oiling is by a multi-feed oiler, speed variations are through a selective set and final drive through a ball bearing floating rear axle.

Reliable Dayton in Improved Form

The improved Reliable-Dayton is a motor buggy only in that it uses buggy wheels but in other respects it is a full-fledged runabout car. Its chassis layout has been entirely changed during the year. Now it has a two-cylinder water-cooled motor rated at 20 horsepower placed crosswise in front under a bonnet. From this the chain of connection to the rear drive wheels is through a contracting band clutch, jointed propeller shaft to a sliding gear transmission incorporated with the differential on a jackshaft in front of the rear axle. From the jackshaft drive is by side chain to the back wheels. This car is the first of the motor buggies to use a sliding gear transmission, and it gives two forward variations and one reverse. The car has a wood frame, Timken axles, semi-elliptic springs in front and full elliptics in the rear and rack and pinion steering gear. In conjunction with the motor should be noted mechanical valves, pump water circulation with vertical tube radiator, float feed carbureter and dry cell ignition.

Continental, Made in New Haven, at the Show

The Continental car made in New Haven is seen for the first time at a show. Its earmarks are: 40-horsepower motor with cylinders cast in pairs and valves on one side, the cylinder measurements being $4\frac{1}{2}$ and 5-inch bore and stroke respectively; five-metal disk clutch with cork inserts; selective three-speed transmission located amidships and with its shafts carried on Hess-Bright ball bearings; Timken rear axle; I-beam front axle, and five brakes, internals and externals on the rear wheels and one on the drive shaft.



GAETH MOTOR, SHOWING THE VALVE SIDE



LUBRICATION, the keynote to car preservation and a subject with which nearly every maker has wrestled during the past spring and summer, is the one department of the motor car that has been altered by nearly every maker. In many cases these alterations are of a minor nature, consisting in the adoption of a new lubricator, changing the location of the oiler, adding compression grease cups to parts of the car previously without them and in other cases fitting an entirely new system of motor and gearbox lubrication. The five accessory exhibitors of multiple oilers, including McCord, Hill, Hancock, Kinsey and Pedersen, show in some cases redesigned pumps and feeds and in others the mechanisms are as seen at the show last January. In the grease and oil field one or two new names appear in the dealers' list but the old stand-bys are Harris, Dixon and the New York and New Jersey Lubricant Co. In some cases these concerns have increased their line by a new transmission grease and in others an added grade of cylinder oil is the improvement story. The Bowser is the only exhibitor of oil and gasoline storage systems for garages and salesrooms. In the field of compression grease cups, oil guns and other oiling necessities the changes are very rare and of an inconsequential nature.

In the oiling improvements in cars the most important is that, as noted in several cases, of discontinuing the use of the multiple-feed lubricator and incorporating the lubricating system within the motor crankcase. In brief this system includes the casting of the lower half of the crankcase with upper and lower portions, or main and basement parts. The main portion contains a limited quantity of oil for the lower ends of the connecting rods to splash into while in the basement part are 1 or 2 gallons of oil. In the crankcase, either in the main or basement parts, is a gear oil pump, consisting of two steel gears carried in a bronze case, the gears driven from the camshaft. This gear pump takes the oil out of the basement part and delivers it to the main portion of the crankcase and in some cases to all of the crankshaft bearings, to the camshaft and commutator bearings and in some cars to the housing for the half-time gears. Through the leads to these several motor parts a constant stream of oil is delivered—not a few drops per minute as with a multiple-feed system, but a stream through an $\frac{1}{8}$ -inch pipe with a pressure at times as high as 10 pounds. The oil flows over the bearing and drips into the main part of the crankcase in which it rises to a level determined by overflow stand pipes. All oil beyond this level drains through the overflow pipes and filters to the basement part, where it is once more ready to be sent by the pump to all parts of the motor. With this system the oil is circulated and re-circulated on and on throughout the motor, being filtered between the circulations. The majority of cars using Continental motors employ this system but in these engines the gear oil pump is carried outside of the crankcase and generally at the rear, the pump being on a downward continuation of the vertical shaft which carries the timer. Placing the pump without the crankcase demands external oil pipes which are generally of the copper duct variety as used on multiple-feed oilers. In the forward end of the basement part of the crankcase in these motors is a bull's eye for showing the oil level inside. The new Rutenber motor has a crankcase-contained oiling system. This method of motor lubrication is not confined solely to the stock manufacturers of

motors, but rather to car builders who manufacture their own engines. In this category reference might be made to the new Stoddard motor which has valves in the head. In this motor the designer has gone a step further than some of the pioneers in the system by placing the gear oil pump within the crankcase and mounting it direct on the camshaft, thereby eliminating extra shafts and gears. The pump, after drawing its oil supply from the basement, delivers it to a manifold within the crankcase from which copper tubes lead within the crankcase to the crankshaft bearings, the timer shaft, half-time gears and other parts. Connections are made so that by a glass on the dash the driver can tell if the pump is working.

Coming to the oil itself, the A. W. Harris Oil Co. has changed brand names from Excello, A. W. H. and Super to light, medium and heavy respectively in the line of oils. An even more important condition in connection with these oils is the new method of securing to the buyer certainty of the brand in the container. This is accomplished by shipping in 5-gallon square cans with a thin seal under the filler and spout caps. New sizes are also shown in semi-solid oils and greases, round cans running at 5, 10, 25 and 50 pounds being the containers.

The Dixon line of graphite compounds has been added to in the Dixon graphite wood grease. This is a compound of finely ground, kiln-dried cedar, the straight soft fiber of which strongly recommends it for gearcase work. With this sawdust certain mineral oils and greases and Dixon's finely pulverized flake are incorporated. The fiber of the cedar acts as an absorbent for the oil to prevent dripping and giving a spongy texture that does not cake. This compound is shown in a gearcase with the gears running as is also the standard graphite lubricant.

Non-fluid oils are of course the thing displayed by the New York and New Jersey Lubricant Co., the regular stand-by line of K 000 and K 00 special having been added to by a brand under the name of the Millennial, a lighter oil than the K 00. The cleanliness in the use of non-fluid oils is portrayed by a young woman all in white who presents the story written in the vernacular and entitled "The White Boa."

In storage systems the Bowser exhibit is the only one. A new outfit has been designed that can be had with one, two, three or four compartments and a triplicate autographic register. It is of course portable, being mounted on wheels and each compartment is a separate metal tank with an adjustable measuring pump, gauge, filler cap, etc. A lipped tray extends over the entire top of the outfit. The line of adjustable measure roll top oil cabinets has been added to by a cabinet made all of steel giving a cabinet that does not become oil-saturated after long use.

The Hill Precision oiler has been changed in the direction of simplicity. The center post revolves by the usual outside means and worms. This post carries a fulcrumed yoke, one end of which comes in contact with cams suspended from the cover of the oiler and adjustable to give any feed. The post also carries a plunger pump barrel in which is worked the pump piston from the other end of the yoke. The lower end of the barrel registers with the different delivery pipes as the center post is carried around, thus giving the oil supply.

The Pederson mechanical lubricator has been entirely reconstructed, the check valves being done away with, and all pumps

and moving parts moved from the bottom to the top of the box. At the center of the lubricator is the usual worm wheel, on the top face of which is an eccentric plate, the edge of which carries around a pin reaching down from an overhead slotted bar. By this means the bar is both rocked on its axis and moved end-wise each way. Into the slot of this bar project short pins coming from the center of short plunger pistons and working horizontally back and forth, giving a double-acting pump with each piston. All these are carried in a cage that moves back and forth in side gibs. This cage has diagonal cross-over ducts and each gib has two holes through its walls for each pump. The action is as follows: As the slotted bar is rocked to carry the piston to the right the left end of the double piston draws oil from the case through a pipe reaching to nearly the bottom and through one of the pair of holes in that side gib. At the same time the other end of the piston delivers, through the right hand gib, a previous charge to the piping leading to some bearing plate. The cam then moves the carriage along to register the pumps with the other holes of each pair in each gib and then rocks the bar back to reverse the piston. This act shoots the supply from the tank across to the right gauge and the other end of the piston, which had made its delivery, draws in a supply from the base of the sight gauge.

The Hancock oiler, which is new to eastern shows, has a plunger pump worked by a lever through an eccentric off the worm wheel. The fulcrum end of this lever is the end adjustable for pump throw. Attached to the upper plate of the oiler is a header with a four-way distributor in which revolves a right-

angled two-way valve cock. The first movement of this cock registers with the pump plunger way in the header and the duct from the oil supply. The next registry is with the pump way and the feed to the sight. The next quarter registry registers with the pump and the drip cup and the final with the pump and the delivery to outlet tube. Models are shown with slight variations of detail but the principle is maintained as a general whole.

The Kinwood oiler continues its simple construction in which the pump plungers are operated by squared U-shaped rods turned one-quarter over. The rod has its under leg fixed to the head of the plunger and the upper leg turned back on itself and then at right angles to pass up through the cover of the oiler. Working in the opening of the squared U is the roller cam to work the plungers. On the rods above the case are the nuts which regulate the distance that the pump plunger drops, this drop regulating the amount of oil fed.

The F R V board oiler is of the gravity feed type. At the back of the oiler is a pulley giving 100 to 1 reduction. There are spur gears inside the oiler casing at its end, which has a compound lever for lowering and raising a line of buckets, which are cast as a bar and with slight V lips on the forward upper edge. The bucket holes are arrived at by drilling vertical holes through this bar, threading them and putting in screws from the under side. The distance in which a screw is placed regulates the amount of oil for each particular feed. As the line of buckets rises to the topmost position the buckets tip forward, the oil running down an incline divided way which acts at the same time as the sight feed.

ORDER OF EXPLOSIONS IN SIXES—ONLY ONE TAXIMETER CAB SHOWN

The two bold things that stand out in the study of the sixes at the show and the one outside exhibit is the difference in opinion as to the correct order of firing and the correct method of diverting the gas flow—or the non-diverting of it—to the cylinders. Taking the possible combinations, there are in the class 1-4-2-6-3-5 the largest number, made up of these eight: Austin, Berliet, American Mors, Premier, Stoddard-Dayton, Trebert, Welch and York. In the class 1-2-3-6-5-4 there are five in the Acme, Ford, Frayer-Miller, Mora and Napier. The next in order of numerical strength is the class 1-3-5-6-4-2, in which appear the Gearless, Glide and National. Then come two examples of class 1-5-3-6-2-4, in which appear Marion and Thor, and to two examples of 1-3-2-6-4-5, the order used by Chadwick and Colt.

There were other combinations given, but these were shown to the claimants to be wrong with the final result, as the above five combinations out of a possible eight proved to be those used.

The proper construction of the manifold is yet to be worked out to a correct standard, as there is a fierce battle always in store for one who takes up the design from an opposing standpoint. Robbing the designs of detail, the largest number come under the principle of where the feed from the carburetor starts as a T with a short stem; the outer ends of the head then turn into a tube parallel with this head. The leads from this tube is a mere detail of construction, brought about by whether the cylinders are cast in pairs or singly. The entire point made for this generic design by the makers is that this gives the same distance from the carburetor to the valve port and that one cylinder cannot impoverish another. The next group of designs all come under the one of a simple T with feed to the ports from the header, and no attempt made to equalize the gas travel distance. In confusion of detail design one is apt to think there is much difference in the manifold, but a study of them reduces them all to these two.

In ignition there is practically unanimity. The high-tension magneto is used and this is supplemented by a battery and coil. Occasionally one hears an inquiry about the use of make-and-break on a six, but where explanation is vouchsafed it of course tells that the rapid sequence of ignition in a six makes the possible drag in the make-and-break mechanism the entire factor.

There is but one taximeter shown and this is at the Lavalette booth. It is of the type used on the French taxi-cabs, which have so suddenly made their appearance in numbers in New York. It is a rectangular box about 8 by 6 inches and 6 inches deep. It is put at the left end of the driver's seat, the face pointing so both passenger and driver can see it. Near the top is a dial opening, through which is read "day" or "night" or "non-recording," either one of these being thrown into view by a small lever on the outside. Below this are two side-by-side dial openings with the word "fare" above them, "dollars" above the left opening and "cents" above the right opening. Below these are two openings for dollars and cents, above which is "extras." On the back are six recording dials that present all the appearance of odometer readings, which register the fare and the various culminations of mileage fares, etc., for office-checking purposes. The mileage is run by a flexible shaft from the front wheel and the tariff charges by clockwork within the meter itself. This clock registers the fare in dollars and cents at a rate which is determined by whether it is day or night. This is read through the upper opening in the dial. Of course, throwing in the non-recording reading disconnects the clock from the fare registry. The dial for extras is manually effected by the driver through two push buttons coming out at the back of the meter, one button for dollars, the other for cents. That there should be only one of these devices shown is surprising in view of the fact that already New York streets are becoming dotted with taxicabs, and there is every indication that it will not be long before they will be shoving the hay motors into the background. Walter C. Allen, interested in the New York Taxicab Co., says his concern just received one big consignment of these taxis and that in a short time he expects to fire the opening gun in the campaign the company is going to wage against the horse. There were numerous inquiries from the curious who had heard of taximeters, but never had seen one, and in consequence the Lavalette booth men had a busy time of it telling just how the device is constructed, how it works and how through its use it is impossible for the driver of the rig to charge more than the legal rate as set by the city authorities who aim to prevent extortion by the hackman.



Transmission of Power.



THE transmission story of the show amounts to a couple of new styles of speed variators and the more general adoption of selective gearsets at the expense of the straight sliding set, coupled with quite a revival of the planetary system for motor buggies. To this should be added the turning to the carrying of transmission sets on the rear axle in conjunction with the differential gears and the more thorough encasing of the shifter bars in the case of selective sets. The four-speed selective set—that is, four forward speeds—has a most limited following, a few of its devotees being Rainier, Austin, Allen-Kingston, Crawford, Chadwick, American roadster and Cleveland. Some of these have direct drive on the fourth or high speed, and the Rainier and Cleveland have direct drive on the third speed. The other selective sets use three forward variations with one reverse. The H-slot quadrant for the change speed lever is continued by many makers, but in the Warner the single slot and rocking lever is in use, the lever being rocked outward and then pushed back and forward for two speeds and rocked inwards and pushed forward and back for the other speeds. Those cars with four forward speeds generally use an extra slot in the quadrant for the reverse, entrance to which is by latch. In the Austin cars the change speed lever works in a single slot.

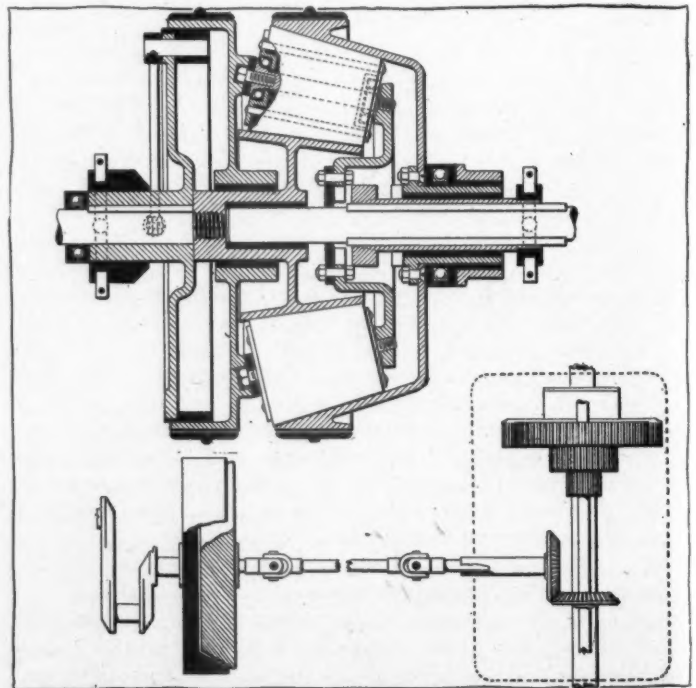
In looking over the different selective gearsets a few changes are noted in the castings for carrying the gears, the trend being to make a one-piece case with end openings for inserting the shafts with gears, threaded caps closing the openings. This case is practically oil-tight, whereas the gearcase, made in halves with the line of union in the plane of the bearings for the shafts, offers greater chance for oil leaks. In nearly every case the gearsets are more compact, the day of long shafts and widely spaced gears having passed. Now gears are well packed on the shafts and the amount of slide given a gear in changing speeds is very slight, giving a shorter shaft length between the bearings.

There remain in use a few individual clutch transmissions, notable among which are the Welch and the Manhattan, the latter the commercial cars made by Mack Brothers. In both sets the gears on the main and countershafts are always in mesh, with those gears on one shaft rigid with the shaft and those on the other shaft locked to the shaft by different kinds of clutches. In the Manhattan cars the gears on the mainshaft are loose, being carried on the shaft by Hess-Bright bearings. Each gear has an internal gear cut in its hub and into this meshes a sliding gear on the shaft, the sliding gear being attached to the shaft by integral keys. There are four sliding gear-clutches on the mainshaft arranged in pairs, and each pair controlled by a shifter rod, the gearset being selective in its nature. In the Welch car the gears are locked to the shaft by disk clutches.

Of the new transmissions the Gearless offers the greatest interest in that it is a combination friction-planetary-direct-drive affair. On direct drive an expanding friction clutch locks the crankshaft and propeller shaft as one, the same as in a selective or sliding gearset when running on direct drive. There is only one other speed ahead and it is through a planetary movement but differs from a planetary set in that there are friction rollers instead of planetary gears and drums and cones in place of spur gears and internal gears. In brief, it is a planetary gear

with gears not having teeth but smooth surfaces. The reverse is through a similar planetary movement. The illustration of this transmission shows the expanding clutch at the left end and the cone on the shaft for expanding it. On the mainshaft in the same vertical plane as the right end of the cone-shaped friction rollers is a sliding jaw clutch which is pushed forward on the two forward speeds to lock the propeller shaft with the framework carrying the coned rollers and on reverse this clutch is drawn back—to the right—to lock with the hollow cup which bears on outer surface of the rollers. Two friction bands encircle the set, one clamping on the cup just mentioned and the other on the clutch cup within which works the expanding clutch. This gearset has been used for months and gives excellent results. It is light in weight and simple to operate. The exponents of friction transmissions are Lambert, Cartecar, Hatfield and Schacht, all of which employ the friction wheel and friction disk scheme, moving the friction wheel across the face of the disk to give speed variations.

The Cameron gearset is incorporated with the differential on the rear axle and is a spur set. Surrounding the differential is a large spur gear instead of a bevel gear as used in most cars. In front of this spur gear is a three-stage spur gear carried on a crossshaft, each of which stages or gears can be meshed with the differential gear by slipping the three-stage gear sidewise and back into mesh with the differential spur. Drive on reverse is by an intermediate idler. Communication from the cone clutch in the motor flywheel is by shaft with bevel gears for transmitting to the crossshaft carrying the three-stage spur gear. All movements are easily accomplished.



GEARLESS AND CAMERON TRANSMISSION



Bearing

Plain-Roller-Ball

A COMBINED radial and end thrust ball bearing, the product of the New Departure Mfg. Co., is one of the most striking novelties in the line of bearings. It simply is a pair of annular bearings of special form, as regards the outer race, and having the two inside races deeply grooved and formed in one piece. A notched separator spaces the balls. As the outer races are not in contact, it follows that when an end thrust is applied to one it will be endured by the first row of balls, leaving the second row free to sustain the radial load. The thin outer sleeve acts as a retainer. The makers guarantee these bearings for 2 years.

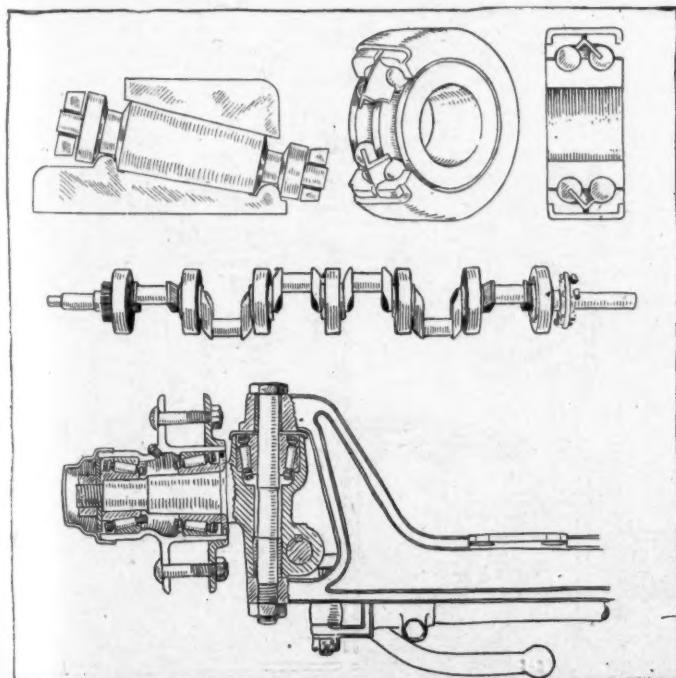
The Hess-Bright Mfg. Co., whose strongest argument is accuracy in manufacture and the exceptional physical properties of the materials used, is showing no novelties this year. Contrary to its former custom, it is represented only by a small space, and transacts the more important business at its headquarters in nearby hotels.

The F. & S. imported ball bearings, shown by the J. S. Bretz Co., are known already. They are of the annular type, in which the balls are assembled through slanting grooves leading from the outside to the races proper. These grooves are slanted in opposite directions and are not quite as deep as the races, so some pressure is needed to force the last balls in. The races are intended to run in such a direction as to oppose the tendency of the balls to escape by way of the grooves.

The Timken Roller Bearing Axle Co. has on exhibition a large variety of axles, transmission gears, differentials, etc., equipped with its type of bearing. Among these are two types of shaft drive rear axles for pleasure cars, of the floating type,

NEW TIMKEN BEARING

NEW DEPARTURE BALL BEARING



TIMKEN ROLLING BEARING SPINDLE

BALL BEARING CRANKSHAFT

fitted with double brakes, for cars weighing empty up to 2,000 and 2,800 pounds respectively. The gears and differentials of these two axles are proportioned to transmit 25 and 40 horsepower respectively. It shows also a shaft drive axle of the fixed type, for cars weighing empty up to 2,800 pounds, fitted with a Hegeland equalizer in place of a differential. For pleasure cars it shows also front axles of several designs, one of which is shown in the accompanying sketch. It has roller bearings in the knuckle heads, and is intended for high-powered touring cars weighing up to 3,400 pounds empty. For commercial cars it has three sizes of I-beam front axles suited to trucks weighing with load from 6,000 to 14,000 pounds; also dead rear axles and a variety of hubs and bearings mounted on spindles for all types of cars. The leading point claimed by the Timken company for its type of bearing, aside from its adjustability, is the fact that the rollers are guided and restrained from endwise movement by the use of a groove at each end running on a flange on the cone. As these flanges have a slight dragging effect, it is argued that if the rollers were held endwise by a flange only at one end they would tend to slew sidewise.

The Brown-Lipe Gear Co. is showing its regular line of differentials, steering and transmission gears. The novelties, however, are chiefly in improvements made to the selective type of transmission, and are mentioned on another page.

The Standard Rolling Bearing Co. shows an improved form of the Grant roller bearing with conical rollers. In this new bearing the rollers are solid instead of hollow, and are drawn in temper to give them ability to bend without breaking. The ends of the rollers are reduced in size and run in a cage whose holes are drilled smooth instead of being punched, the object being to hold the rollers parallel. The material is the company's special standard alloy steel. The makers state that they find a different angle of taper necessary for motor car work from that required for wagon axles on account of the greater end thrust of the car when turning corners quickly. The American Ball Bearing Co. shows a full line of its standard products, but states that its new products were made to customer's specifications and therefore be announced by those using them.

An attractive detail noticed in the De Luxe cars is the use of ball and socket joints connecting the various arms and links of the spark and throttle control. These bearings take the form indicated in the sketch, having a stem projecting from the ball through a slot in the cup, with a small spiral compression spring and cotter pin to take up wear. In view of the annoying effect of wear in the small control linkages of many cars and the considerable cost of making durable bearings of the ordinary sort for them, the simplicity and practicability of this device are apparent to the observer.

The exhibit of the Standard Roller Bearing Co. includes a variety of front and rear axles for trucks and motor cars of all sizes, equipped with the company's various types of parallel and taper roller bearings and the Standard annular ball bearings. One form of motor car rear axle has the speed-changing gears contained in a forward extension of the axle casing. This casing is of cast steel, with the axle tubes and the tube enclosing the propeller shaft forced into place by hydraulic pressure and riveted. All the bearings are of the Standard ball type.



Carbureters and Mixing Devices

A SCORE of differently designed and constructed carbureters are on hand at the show, nine of which number are manufactured by separate concerns and sold to car manufacturers. Eleven are carbureters made by car manufacturers for their particular cars. As the stock-made line interests the greatest number of buyers an analysis of them is logically the first department of a carburetor resume.

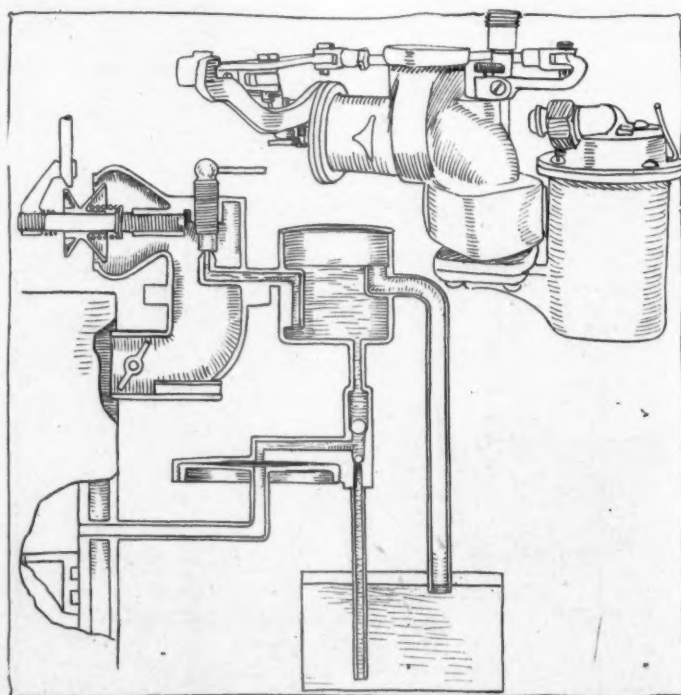
Speaking generally, carbureters are not much changed over the 1907 models and the alterations are in the cause of simplicity. A couple of makes, the G & A and the Krause, are entirely free of springs for controlling valves, while in a couple of others provisions are included for either varying the spring tension as desired or cutting it out. The auxiliary air valve is in place on upward of a dozen types. In some of the others different styles of air valves are in place. All but one, the Brush, use a float for maintaining a determined gasoline level, but in the Brush this is done by means of a diaphragm pump and an overflow pipe. In the G & A the auxiliary air valves are round balls which obstruct small holes, the balls being raised by the motor pull on high speeds allowing air to enter through the holes. Not a few makers have concluded that it is best to control the gasoline as well as the air and have arranged an interconnection whereby the throttle movement carries with it a predetermined relative movement of the needle valve in the stand pipe. In the new Aeme this interconnection is taken a step further so that the movement of the throttle acts also on the needle valve and regulates also the normal air entrance. Cork and metal floats are about equally divided and the wise ones who predicted nothing but concentric carbureters for next year, that is carbureters with the spraying nozzle in the center of the float, are doomed to disappointment. It must not be interpreted that the concentric style is on the wane. Far from it; rather it is gaining slightly—very slowly. Aluminum is the constructive material generally used but not a few use red brass and other alloys. The multi-spraying nozzle, that is the double and triple carburetor, with two or three nozzles for the gasoline to flow from and as many throttles is seen in only one case and that a new comer.

The G & A carburetor, a French construction, is made without springs of any nature and possesses a separate float chamber and a peculiar form of ball valve for an extra air supply. The air passage is a venturi tube, in shape resembling the glass or an hour glass. Air enters through the screened lower end, and gasoline is received through an angling pipe at the small-diameter center part of it, there being no needle valve in the nozzle. The size of the nozzle, however, is mathematically calculated in proportion to the motor as well as the size of the venturi-shaped air passage. To the top of the venturi tube part is secured a drum portion in which is a rotating throttle. Interposed between the top of the venturi tube and the throttle casing is an expansion in the bottom of which is a series of varied sizes of holes. Resting in each is a round metal ball. The balls, being of different weight, it follows that when enough air cannot enter through the venturi tube, then the air pull will raise the lighter balls and as the pull increases the heavier balls will be raised.

The Krouse carburetor has eleven spraying nozzles, which can

be brought into use one at a time until all of them are emitting gasoline. The carburetor resembles a drum placed on end. This drum is nearly all float chamber with a concentric air chamber surrounding the float chamber. The lid, or top of the float chamber contains eleven stand pipes, the bottoms of which conduct the gasoline in the float chamber. These eleven nozzles form a semi-circle and immediately above them is a metal semi-circle which can be revolved so it covers any number or all of the nozzles, shutting them off entirely. Around each nozzle is a small air vent so the air can rise past the mouth of the nozzle and mix with the gasoline. The carburetor has no springs and the only moving portion is the throttle which is the semi-circle mentioned and which effectively shuts off the gasoline and air, a nozzle at a time.

Perhaps the simplest carburetor is found on the two-cycle, two, three and four-cylinder Atlas motors. This carburetor is without a throttle for controlling the mixture or air and the only control it has is that the needle valve in the spraying nozzle is connected with a lever on the steering wheel which is moved back and forth, opening or closing the gasoline orifice according to the motor speeds needed. In construction the carburetor is a horizontal tube with the air entering at one end and the escape to the motor at the other end. Midway of the ends in the center of the tube stands the spraying nozzle with its needle valve coming through the top of the tubing and having its steering wheel connections. Beneath the air tube is a conventional float chamber. To facilitate starting a butterfly valve is placed on the air end of the tube, which valve can be



BRUSH CARBURETER

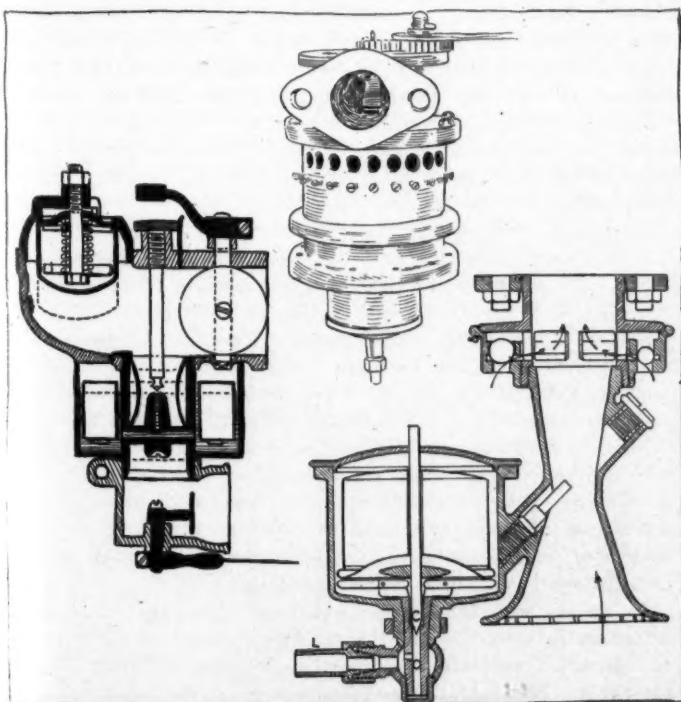
ACME CARBURETER

held partly or entirely shut to insure a good pull of gasoline on the first few turns of the motor.

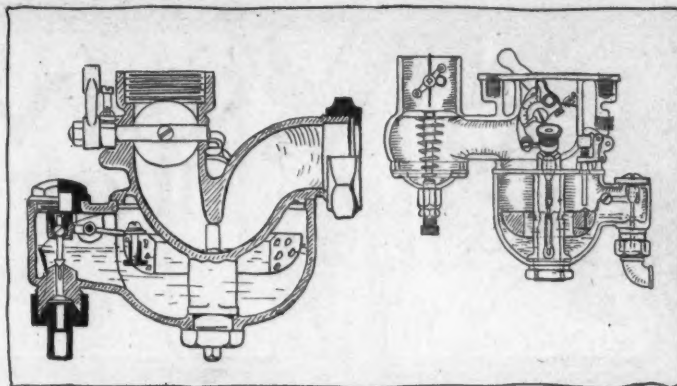
In the Bowers carbureter the principal of design is the venturi tube, which, however, is cut into two parts at its smallest diameter in the center and the top part made with a flaring flange at its lower end, which slips over the small coned top of the bottom part of the tube, leaving a circular air space between them. This carbureter has a concentric metal float—being a perfect ring—and the stand pipe is in the top opening of the lower half of the venturi tube. Normally air enters the open lower end of the tube and passes up through the restricted tube and past the nozzle. Enough air cannot enter this way for high speeds and to provide for an additional supply a ring chamber is located beneath the bottom of the float which has two air openings, each guarded by a spring-controlled poppet valve, one spring stronger than the other so one valve opens first, followed by the other, if the motor pull is hard enough. The air so entering does not go through the lower half of the venturi tube but between the lower half and the flared bottom on the upper half, so the air does not pass close to the mouth of the stand pipe and its pulling force of the gasoline is less, so a mixture with a less percentage of gasoline on high motor speeds is gained. The throttle is a rotating plate at the top of the upper half of the venturi tube which plate has triangular openings which can be coincided with similar openings in the permanent top of the venturi tube.

The carbureter on the Brush runabout is novel in that the gasoline is pumped into what looks like a float chamber without a float by a diaphragm pump. The diaphragm pump at one side connects with the motor crankcase and at the other side with the gasoline tank, there being interposed two ball valves, one in the tube between the gasoline tank and the pump and the other between the pump and the empty float chamber. On the up stroke of the piston gasoline is drawn from the tank and on the down stroke it is forced into the floatless float chamber. From the float chamber is an overflow pipe back to the gasoline tank for times when the pump delivers more gasoline than the motor needs. From the floatless float chamber the gasoline rises to a level in a stand pipe or spraying nozzle, past which flows an air current which licks up the liquid. A spring-controlled auxiliary air valve is fitted.

Three Schebler types are shown, the 1908 one differing from those previously brought out by detailed improvements and adjustments but not in principle. The normal air opening is



BREEZE, KROUSE AND G. A. CARBURETERS



NEW HOLLEY AND SCHEBLER CARBURETERS

through the center of the float chamber and the auxiliary air supply through a horizontal pipe which joins the other above the float chamber, so now the mixing chamber is entirely above the float chamber. The adjustment of the carbureter is altered in that there are three adjustments, two of the needle valve in the stand pipe and one of the auxiliary air valve. The first gasoline adjustment is through a knurled button which gives the adjustment for low throttles. The second adjustment is through an eccentric cam which gives delicate gasoline adjustment for open throttles. Between these extremes the adjustment of the spring on the auxiliary air valve is deemed sufficient. The cork horseshoe-shaped float is continued, the carbureter castings are made of red brass or aluminum and the throttle is a butterfly valve in a waterjacketed casing instead of a sliding disk valve.

The Breese carbureter has a venturi-hour-glass tube passage around the spraying nozzle, which nozzle is located in the center of the float chamber. The normal air opening at the bottom has a starting valve in the form of a shutter which can be partly closed when cranking the motor to create a stronger pull on the gasoline. The valve is worked by a rod connection through the radiator. The mixing chamber is a horizontal tube lying over the top of the float chamber, with one end guarded by the spring-controlled auxiliary air valve and the other carrying the butterfly throttle valve. The needle valve extends from the top of the mixing chamber into the top of the stand pipe and has a threaded adjustment.

The new Holley is without a spring-controlled auxiliary air valve as well as springs of any nature. In a word, it is a U-shaped pipe sitting into the top of the float chamber so the lowest part of the U dips half way to the bottom of the float chamber, the float being a ring piece surrounding the bottom part of the U. The U pipe is made like a venturi tube. The nozzle is in the bottom of the U and around it in the bottom of the U is a small pool of gasoline over which the entering air passes and, picking up the gasoline, goes to the motor. The carbureter is very much after the designs seen a year ago on Great Smith and Winton cars.

The new Kingston practically is the same as the 1907 style, except that on the stem carrying the spring-controlled auxiliary air valve is a nut by which the movement of the valve can be restricted, that is the valve prevented from opening beyond a certain limit. This carbureter is nothing more than an elbow tube lying over the top of the float chamber with the stand pipe in the tube and a normal air opening rising through the float chamber. The throttle is in one end of the air tube and the auxiliary air valve in the other end.

Not a few cars are fitted with the Mayer carbureter, which is conspicuous because of a separate float chamber and a waterjacketed mixing chamber.

Probably the majority of the cars in this show are fitted with carbureters of stock make, some one of the many lines being found to suit a particular car. The car maker is apt, however, to sooner or later make his own carbureter after considerable experimenting, often determining that he is satisfied that a specially-designed carbureter is better for his motor than one that fits anything. Still the carbureter makers manage to be busy.



Valves and their Actuation

SIXTEEN and two-thirds per cent of the makers exhibiting cars build motors with valves located in the heads. Of this number six, the Moon, Premier six, Welch, new Jackson, Brownell and new Ellsworth, have overhead camshafts. Two of the cars included in the category, the De Luxe and Stoddard-Dayton, use one rocker arm for two valves but do not carry the camshaft above the cylinder heads. The Mitchell and Austin cars have the exhaust valves located in the bottom of valve chambers on the cylinder sides and the intakes above them, the intakes calling for rocker arms for opening them. The Frayer-Miller and Cameron cars—both air-coolers—place the valves horizontally in the opposite sides of a chamber in the cylinder head and open them by a push rod and bell crank scheme. Such makers as Carrieco, Marmon and Dorris locate the intakes and exhausts vertically in the heads and use a rocker arm for each valve, with either one or two camshafts. The remainder of the cars exhibited follow the imported conventional method of placing both intakes and exhausts in the floors of side valve chambers, being content with using one valve chamber on the right or left, in which is room for the intake and exhaust valve for each cylinder, or using chambers on both sides and locating the exhaust valve in the floor of one and the intake in the floor of the other.

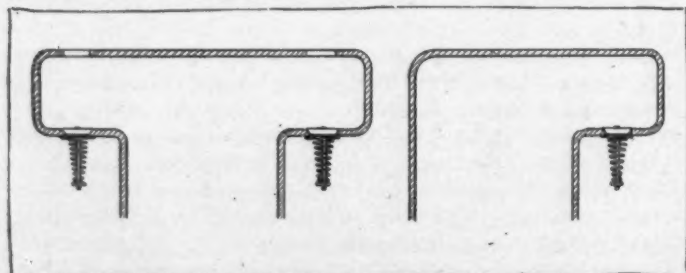
The leading trend of the situation is the problem of placing the valves in the head. Many makers believe a motor with valves in the head gives more power for the same piston displacement than does a motor with valves in chambers on the side of the cylinder head, but they are afraid to make the trial because of the extra noise they know will come of it. The noise side of the problem does not appeal to many makers, as they feel it could largely be overcome, but they object to the encumbered appearance caused by the overhead rocker arms. Then, too, in some cases there is the question as to the additional time required in removing an overhead valve in which operation the rocker arm has to be taken off and the valve cage extracted. With a few followers of the valve-in-the-head motor it would be unnatural to anticipate a solution of the noise, encumbered appearance and speed-of-removal features in a year or so because of not sufficient energy being expended, but even with 16½ per cent of the exhibitors working along these lines, and only about four of those real creators, the others blind imitators, it is progressing at a good pace and in the right direction.

In a hasty and somewhat desultory resume of the cars on exhibition in the Grand Central palace, in which the valve situation and operation is the crux of the situation, it is discovered that

valve location comes under nine clearly marked divisions. Each of the nine has its own clientele, some a single maker, others two, others four and some twenty. To begin with, the most popular is the inverted L head motor, the motor with an integral valve chamber on one side, either the right or left, and the placing of the valves in its floor. This motor is manufactured by such builders at Rutenber and Continental, and has a large following among builders of assembled cars—cars for which the motor is purchased one place, the clutch at another factory and the gear-set, axles and steering gear at different points. Why engine builders have selected the inverted L style of motor is a debatable problem but undoubtedly because easier-to-make cylinder castings, one camshaft, etc., play their part in determining the style. With some makers one camshaft is preferred to two simply because it makes a motor with fewer parts, whereas others prefer the two in that they give a better balanced motor. One camshaft can be made sufficiently strong to carry the eight cams for intakes and exhausts on a four-cylinder motor. Those who place the valves on opposite sides of the cylinders do so in the cause of symmetry in the hope of getting larger valve diameters and to secure larger water spaces around the exhaust valves to simplify the intake and exhaust manifolds and also to achieve more accessible valve springs. With opposite valves, one side of the motor is not absolutely concealed by the intake and exhaust manifolds together, the eight valve lifter rods, the valve springs and lifter rod guides. Cylinders for opposite valves are generally more difficult to cast, more of the castings are junked because of sand holes, and, in short, the expense of construction is increased by this valve disposition. On three new ones at the show, Allen-Kingston, Continental, Overland, Marion six, Klink, new Cleveland and Imperial, the valves are carried on one side.

In approaching that class of motor with valves in the head the halfways form the natural connecting link between valves so mounted and those carried in the bottom of the side valve chambers. In this class the exhaust valve is invariably located in the floor of the offset valve chamber and the intake carried immediately above it in the opening where the valve cover cap generally is threaded. The Austin maker prefers this valve construction and uses a long lifter rod and rocker arm for opening each intake valve. Valves so located offer a good solution to several valve problems that are faced with cylinders having only one valve chamber. Placing the intake above the exhaust allows of using as large valves as can be fitted where chambers are carried on opposite sides of the motor. There also is the other advantage that one camshaft is sufficient for opening both sets of valves. Whatever there may be in the noise problem, it is met half-way because the exhaust valves are located low, where their noise can be muffled. The lifter rods for the intakes generally rise between the adjacent cylinders, so the rocker arm parallels the crankshaft instead of being at right angles to it. In the Mitchell cars the overhead intake valve is used.

In motors with intakes and exhausts in the head those using water-cooled cylinders differ so decidedly from the air-coolers as to demand a separate consideration of them. Placing the air-cooler first because it introduces valves in the head, the most conventional class is that illustrated in the Marmon and Carrieco

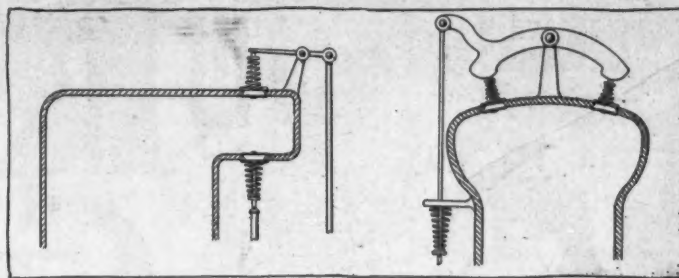


T AND INVERTED L CYLINDER HEADS

motors, in which the intake and exhaust sit vertically into or on the cylinder head and have a rocker arm for each valve, both rocker arms actuated from the one camshaft. At first the motors with this design did not attract the outer end of the rocker arm to the top of the lifter rod, with the result that every time the cam raised the lifter rod it struck a blow on the outer end of the rocker arm, which was immediately followed by the inner end of the rocker arm hitting a blow upon the top of the valve stem. There were two distinct noises, which made a noisy motor. Later construction secured the adjustments so that the knock was minimized and so that springs held the rocker arm on the top of the lifter rod, thereby eliminating one of the knocks and leaving only that occasioned by the rocker arm hitting the top of the valve stem. Other makers have still further reduced the noise by hinging the outer end of the rocker arm to the top of the lifter rod as well as placing a spring for holding the inner end of the rocker arm on the top of the valve stem, with the result that the only knock is when the cam in the crankcase strikes the roller on the lower end of the lifter rod. As this noise occurs within the crankcase, it is practically entirely muffled.

The Frayer-Miller and Cameron cars use a different system of valves. In brief the cylinder bore is continued above the cylinder head in the center, forming an oblong space over the center of the combustion chamber, the long diameter of the oblong being vertical. In the right side of this space is the intake valve and in the left side the exhaust valve, or vice versa. The valve stem is horizontal and has to be pushed inwards in unseating the valve. To do this calls for a bell crank, or, in other words, a rocker arm shaped like the two arms containing a right angle and hinging it on a fulcrum bolt at the angle. One arm rests against the end of the valve stem and the other hinges to the top of the lifter rod, which receives the usual lift from the camshaft carried within the crankcase. This construction is used in the Frayer-Miller because the cooling air current strikes down on the cylinder head. Locating the valves in this manner places them in the direct path of the cooling air. The same valve location is used on the Cameron, but the means of opening it differ. There are no lifter rods but simply a long rocker arm placed vertically up the cylinder side. The top end rests against the end of the valve stem and on the lower end is a roller which is at the side, not on top, of the camshaft, so the cam pushes the lower end of the lifter rod out, which pushes the top end inwards upon the valve stem. The rocker arms are of great length, like those used on the two-cylinder Jackson.

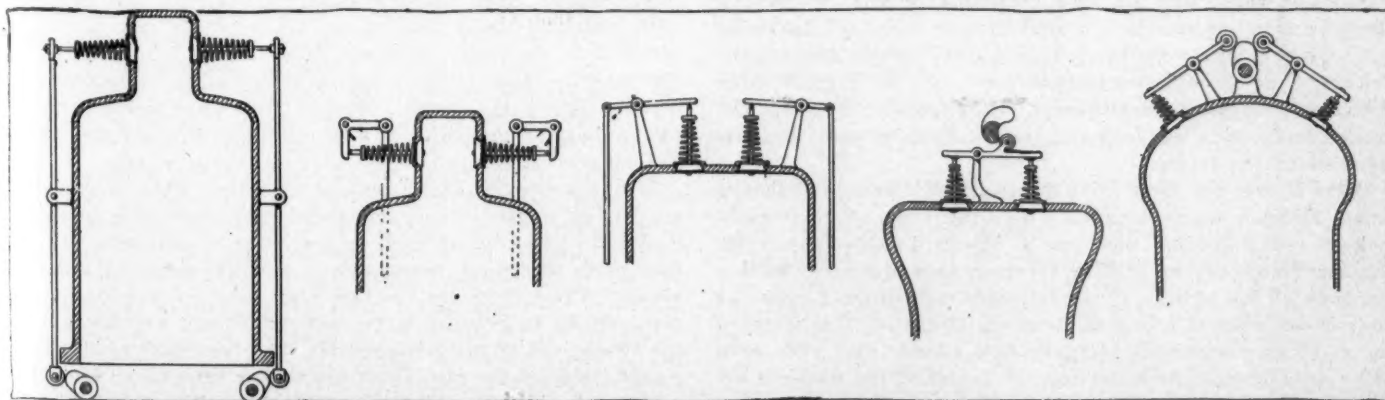
Passing to the water-cooled motors with valves in the head, an analysis places them in three classes: First, the Welch and new Jackson, with intakes at one side and exhausts opposite, both sets placed at an angle outward from the center and with an overhead camshaft; second, the De Luxe and Stoddard, with valves placed oppositely, inclined outward at a slight angle and with the camshaft contained within the crankcase at one side and with but one rocker arm for the intake and exhaust valve for each cylinder; and, third, the class typified by the Moon and new Ellsworth, with an overhead camshaft, one—the Moon—having one rocker arm for two valves and the other a rocker arm for each valve. In all of these motors the designers have taken



AUSTIN-MITCHELL -- VALVE DESIGNS -- DE LUXE AND STODDARD

due consideration of the proper amount of water space surrounding the valves. In the early water-cooled motors of this style the waterjacket space was deficient and heating of the valves resulted. This trouble caused one or two of the real early makers of this style of motor to give it up in despair. The water trouble has been overcome now and without abnormally distorting the size of the casting head. In the De Luxe and Stoddard, as well as the Moon, with one rocker arm for each cylinder, a compound cam is used, which has a regular cam part to raise the lifter rod for opening the exhaust valve, and a hollow or cut away part into which the lifter rod drops and which a spring forces downward with sufficient force to open the intake valve. Thus the intake valve is really opened by a spring and not by a cam, except in that the cam says when the spring may work. The lifter rod always hinges to the end of the rocker, but it is impossible to have the rocker arm always resting on the ends of the valve stems and there is a continual knock, which makes the motors a little noisier than the other styles. This noise is gradually being eliminated. The Moon car uses the one rocker arm with the overhead camshaft and thereby dispenses with a lifter rod for each cylinder. The method of opening its valves is identical with that employed in the De Luxe. In the Ellsworth the overhead camshaft has a rocker arm for each valve.

The overhead rocker arm looks good to a great many buyers and dark to others. It is hard for human nature to see in a motor that to open a valve there must be so many parts and that these parts are not increased in number whether the parts are housed in the crankcase or placed on the top of the motor. The camshaft placed within the crankcase has its cams and bearings besides the rollers on the bottom of the lifter rods, but all of these parts are hidden, so the smooth surface and even contour of the crankcase hides a multitude of parts. Place all of these parts on top of the cylinders and the buyer stands aghast to think that he is to buy a motor of such complexity, when in reality he often is buying one with fewer parts. There is one trouble with the overhead camshaft and the rocker arms, namely, that of proper lubrication. Within the crankcase everything is cared for by the splash, but on top of the cylinder heads sufficient oiling arrangements must be added. The Ellsworth has wrestled with this by entirely enclosing the camshaft and rocker arms, giving quite a cumbersome appearance. The Stoddard has aimed at lubrication by the addition of compression grease cups, and in the Moon car are large oil reservoirs for each bearing.



CAMERON

FRAYER-MILLER

-- VALVE DESIGNS -- DORRIS

MOON

WELCH AND JACKSON



THE growth of the motor business is nowhere shown to greater advantage than in the display of chassis made at this show. There are thirty-five complete types exhibited and nearly all of these are highly polished. Any one of these 4 years ago would have been the center of attraction. This is not that they lack attention now by any means because each one of them has a coterie of people studying them constantly. The practice of running the mechanism during the show has died out, the only one that is so operated this year being the Cartercar, which demonstrates its transmission system. The difference in the design of frames, while of the same general construction as in previous years, is more noticeable than any other part of the '08 car, tending toward the lower center of gravity, by means of lowering the body and occupants without decreasing the road clearance. The American roadster, as it did last year, accomplishes this by means of its underhung frame with a super instead of a sub-frame for motor and transmission support.

The Imperial is another exception to the general rule, having a frame which drops at about the dash and rises again at the rear axle to provide sufficient axle clearance. This construction, besides lowering the center of gravity, also lessens the angularity of the driving shaft and brings the passengers nearer terra firma. The floor of this car is only 23 inches above the ground. The Dragon roadster is another car of this type, which accomplishes the same thing by having the spring seats on the front axle drop, raising the rear end of the frame. This does not interfere with the road clearance and brings the floor of the car to within 20 inches of the ground. This type of construction for roadsters gives them the racing effect which seems to be so much desired at present.

The pressed steel frame is in the lead still, nearly all types being of the C section except in the case of the De Luxe car, which has the U section which it used previously. The only wooden frames noticed in pleasure cars are on the Lambert, Brush and Great Smith. In the case of the Great Smith this frame is set flat and a truss rod is used underneath to stiffen it. Most of the steel frames are constructed from 20 to 25 point carbon steel, of 8 to 12 gauge, depending upon the load to be carried; the general practice seems to be to form these plates cold and rivet them with hot rivets. The Rainier has a unique method of supporting its rear transverse spring by curving the rear cross member into a semi-circular form and fastening the spring brackets thereto. This frame extends beyond the body and is rather narrower than formerly. In a great many instances sub-frames are dispensed with, the motors being suspended to the side members and the transmission cases to cross members of the frames.

There is only one three-point suspension sub-frame and that is on the Marmon, which has always used this type. A great many makers are following this year's Stoddard-Dayton by arching the frame up, to provide for rear axle clearance, setting the body on the outside of the frame, though in some cases the body is cut away to follow the lines of the frame. The material for front axles continues to favor steel I-beam with yoke ends and a drop of about 4 inches from the center of the wheel to the top of the drop underneath the crankshaft. It is noticeable,

however, that the spring seats are lower than usual on a great many cars to get the low body effect. Manganese bronze is gaining in favor as a front axle material as well as for a good many other parts in motor construction. A variety of these bronze axles are shown in the Cramp exhibit. Some of the heavy cars and the majority of light ones use tubular steel, and while the yoke for spindles is the favorite type, a few still use the Lamoine. The exception in front axle construction are the Brush, with a wood axle, and the buggyabouts, with the wood and steel constructions familiar to the horse-drawn vehicles. All of the cars, with the exception of the Hatfield buggyabout, have the front axle fastened to the springs, but this car has the fifth wheel device used on buggies and wagons. In the accessory exhibit front axles can be found made of bronze or steel, and in all degrees of strength from the little roadster axle to the massive 3-inch square one for 5-ton trucks. One noticeable feature in connection with the attachment to the front axle to the frame is the tendency to place it farther forward than formerly, especially in the roadster and tourabout, in which it is placed under or forward of the radiator.

It is decidedly a floating type of rear axle year, the majority of cars using this type, though there are a few still using the divided type. There are a variety of constructions of each type, ranging from manganese bronze, malleable castings to an aluminum and steel tubing combination. A new type shown at the Cramp booth is a divided axle with differential case, sleeves and brake supporting brackets in one casting. This has the merit of eliminating the cost of assembling and brazing of the different parts, and makes a strong and reasonably light axle. The strength of the manganese bronze is said to exceed that of steel by 5,000 pounds per square inch. This axle looks like a great advance in construction of the divided type. In the floating type there is a decided advancement, mainly towards accessibility, though some are greatly adding to weight by placing the transmission case on it. One noticeable type is that used on the Pennsylvania in which the removable cap, instead of being on the top, is placed to the rear, directly opposite the propeller shaft housing. It is large enough to allow the removal of the differential and driving shaft. The De Luxe is still in a class by itself in rear axle construction with its I-beam reinforcement. The Brush runabout has a rear axle of wood with malleable ends, clamped on to carry the wheels. It is fastened to the frame by means of a friction joint radius rod. The wheel spindle being eccentric to the axle, the eccentric is used to tighten the chains. Most of the high wheel motor cars use the buggy construction of steel reinforced by wood rear axles. The differentials are all of the spur-gear or bevel type.

In the accessory department is exhibited what is called a gearless differential, which works nicely on the testing frame set up for it. Its point of merit is simplicity, it consisting of only four parts as against twenty-one in the differential that it displaced. These parts are two-face plate ratchets which take the place of the large gears in the differential and are fastened to the two halves of the driving axle. The face plate ratchets are placed inside of the case which has similar ratchets on each side of it, and which engage with each other. The fourth part is

a face plate spring, which holds the two ratchets apart. If this device will do the work it certainly deserves attention, if only because of its simplicity.

If there is any attempt to depart from the wood artillery wheel, it is not indicated at this show, the majority of cars being so equipped. It is noticed that the tendency is toward a spoke that is a little wider and still the same thickness as before. No doubt this is to eliminate or lessen the danger of broken spokes occasioned by skidding into the curbs. The Schwartz is exhibited in the accessory show and is seen on many of the higher priced cars. The Midgley steel wheel is used on some of the Mitchell and Ford cars. The tendency on the higher powered cars is towards wheels of greater diameter, the majority using 36-inch wheels. Wheel bearings are divided between the Hess-Bright, F. & S. and Standard ball bearings and Timken, Standard, and Hyatt roller bearings. The ball bearings are favored by the makers of the larger cars, and the roller by the smaller rigs. The front wheels on most cars are cambered, but the foreign practice of cambering the rear wheels is not followed except in the case of the Moon. The wheel base of cars has not changed much in the past year and ranges from 74 inches to 138 inches on the six-cylinder Welch, and 168 inches on the Manhattan sight-seeing car.

A great deal of attention has been paid to the brake proposition, and an increase of braking surface is shown on the majority of exhibits; in fact one man expressed his opinion that he had brakes enough to burn up his tires in a day's run. Of course this was only intended to show what the spectacular driver who delights in prompt stops could do, and not for general practice. No doubt this increase of braking surface was brought about by the recent Glidden tour, when so many had troubles of this sort. On the Cleveland the brakes on the rear wheels are 16 inches by $3\frac{1}{4}$ inches wide. It has double brakes on each rear wheel and figures about 600 square inches of braking surface. This is one of the largest noticed, although the majority of cars is equally well equipped. The practice tends toward double brakes on the rear wheels, some cars having two flanges with two expanding brakes, others having one flange with a contracting band on the outside and an expanding band within. There is only one exception to the contracting and expanding brakes, and this is found on the Great Smith car, which sticks to the male and female cone brakes. The practice of having the brakes on the propeller shaft is not general.

No water-cooled brakes are shown but on one rear axle exhibited the brake flange has radiating flanges around it, to permit cooling by air. The practice of interconnecting brake and clutch is still popular, although some cars only have this interconnection with the emergency brake. Metal-to-metal brakes and leather-covered brakes are used very generally, but camels' hair belting seems to be a favorite for friction material. The Standard Brake Co. show a metal-to-metal brake with cork inserts, the cork being about one-third the friction surface. This brake is said to be very effective and yet not harsh.

The adoption of sprags is not as general as would be expected. The mechanical sprag is seen on one car, which has a separate ratchet wheel placed on the propeller shaft just back of the transmission case. The dog which operates on this ratchet wheel acts as a piston in a compressed air cylinder to eliminate the shock when the sprag is set by a cord on the dash.

The foreign system of brake equalizers is not seen here, but on most of the cars an equalizing beam is used to equalize the pressure on each brake drum. On the Moon this equalizing beam is under and suspended to the double portion rods. The Ellsworth is the only one which uses a cord equalizer. This cord is fastened to the brake arm, passes through three sheaves, one attached to the frame on each side of the car and the other to the lever on the lever shaft. There seems to be no formula proportioning the braking surface to either horsepower or weight.

Probably the spring proposition was considered perfect a year ago, as there is less apparent change in springs than in any other part of the car. The tendency seems to run toward slightly

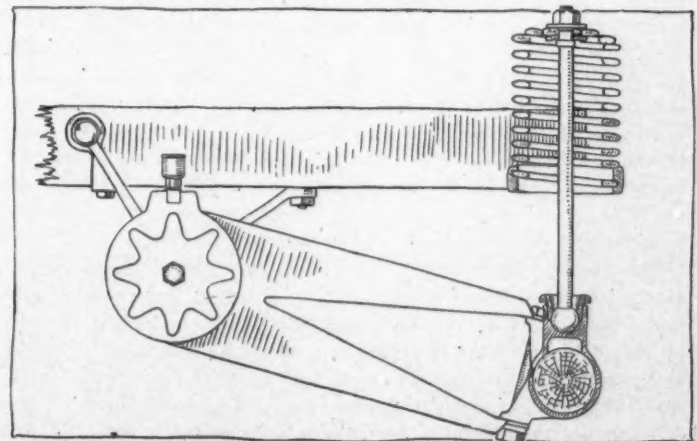
wider and heavier springs, and a few changes in method of spring suspension. The length varies from 36 to 55 inches and the width from $1\frac{1}{4}$ to 3 inches with anywhere from 4 to 16 leaves. There are more semi-platform springs than formerly and in the case of one car, the Moon, a full platform spring is considered ideal. On the Dorris, where the transverse spring has been carried in front of the rear axle, it now is placed to the rear as is customary with the majority of motor cars.

An inquiry as to the material from which springs are made, the favorite steels seem to show it is silico manganese, chrome alloy and vanadium. It is noticed that the majority of springs have clips near each end to hold the various leaves in place. In some cases a small lip on each end of each leaf is turned up to hold it in position. Two cars depend upon spiral springs to eliminate the road shocks and jars. These cars are the Brush and Lansden. On the Brush runabout the axles are connected with the frame by a friction joint radius rod. A stud extending from the axle through a hole in the frame has a flat spiral spring set between the frame and a washer on the top of the stud. One of these springs is placed at each end on each axle, and seems to make a very flexible connection. The Lansden electric uses four spiral springs on each side of both front and rear axles, the axles being held in place by radius rods. While the majority of the cars use semi-elliptic springs, there are a great many who believe the full elliptic to be best for the rear axle. In some cases the full elliptics are used all around. On the Ellsworth three-quarter elliptics are used on the front, the quarter section of the spring taking the place of a front body hanger. The rear springs on this car are full-elliptic, with a method of fastening each half of the springs together which is apparently new in motor car construction. Each end of each half is flattened and the two halves are rigidly bolted together. On all the cars, with the exception of the Gearless, the front springs are fastened rigidly to the frame at the front end, using shackle links at the rear. The Gearless reverses this and the front end of the spring is in shackle, with the rear end rigid.

Among the accessory exhibits the Perfection twin spring was shown. This seems to be an improvement on a similar spring seen heretofore, especially in the method of attachment to the frame. On nearly all the high wheel buggies semi-elliptical transverse springs are used both front and rear.

While several manufacturers' agents claim they make their own steering gears, a close inspection shows that the majority of cars is equipped with steering gears bought from specialty makers. The irreversible steering gear is the favorite, and is used on most of the cars shown. The different makes used are the Brown-Lipe, Warner, Gemmer, and Garford.

Two odd steering systems are shown, one on the Brush which has a reducing gear on the steering post and a lever on the lower end of the steering post, connected by a link to the steering knuckles. On the Hatfield buggyabout there is a sprocket wheel at the lower end of the steering post. This sprocket engages with a chain fastened to each end of the front axle and carried in a semi-circular trough.



BRUSH FRICTION JOINT SPRING DEVICE



Ignition in Its Various Forms

A RADICAL departure from customary arrangements of spark coils and related parts is shown by the Western Electric Co. in its new synchronized ignition system. The most striking feature of this system is that all the spark coils are contained in a long water and oil-proof fiber tube which runs the length of the engine just above and to one side of the cylinders, as indicated in the accompanying sketch. The coils are cylindrical and are simply slid into place through the front end of the tube, making contact with strings when they reach their proper position. The secondary cables are extremely short and terminate next the tube in threaded plugs, which are screwed through the tube into sockets in the spools on which the coils are wound, thus holding the coils in position. The spark timer is on the engine, and has as many terminals as there are cylinders. The only piece of apparatus to appear on the back of the dash is the trembler box, which contains two tremblers actuated by small electro-magnets, and the condensers, one for each trembler. Only one trembler is in use, the other being a reserve for emergencies only. A switch operated by a handle projecting through the front of the box cover puts one or the other trembler into circuit. A switch on the front of the trembler box puts one or the other set of batteries in circuit, and the safety plug belonging to this switch is of special key form and operates a polarity reversing switch. The plug can be inserted only when the reversing switch is open. To close the switch the plug is given an eighth of a turn, when it is locked in position. To remove the plug it is given a one-eighth turn, which at the same time opens the reversing switch. On the next one-eighth turn the direction of the current through the trembler is reversed, thus equalizing the wear on the contact points and saving them from pitting. Incidentally, the fact that the secondary cables are very short avoids the condenser action experienced with long cables lying close to a metal frame or sheet.

Conspicuous among the features shown by the Autocoil Co. is the unusual size of the ammeter mounted on some of the coil boxes. This ammeter is permanently in circuit, and shows in large figures how much current the coil takes. The makers explain the use of a large instrument partly on the ground that accuracy is not obtainable with smaller size, and partly because a small ammeter absorbs itself more current than a large one. The coils made by the Autocoil Co. are separate units, and are sheathed with iron. In some types of coils the secondary positive terminal is carried to the top of the coil unit, and the cable connecting with it passes through the dashboard and up at the back of the coil box to the top. The primary terminals are connected in the same way and the result is a coil box with no outside connections. In these sheathed units the safety spark gap is on the outside, and therefore visible when the cover is raised.

The Atwater-Kent Mfg. Co. shows its well-known spark generator without essential change, but in standard two-cylinder and six-cylinder sizes as well as four-cylinder. The principal feature of this device is that it produces a spark by means of a single and practically instantaneous snap contact in the primary circuit, and therefore consumes the absolute minimum of current. To demonstrate this feature, the makers have placed a four-cylinder spark generator in a glass case with six cells of 6-inch Columbia

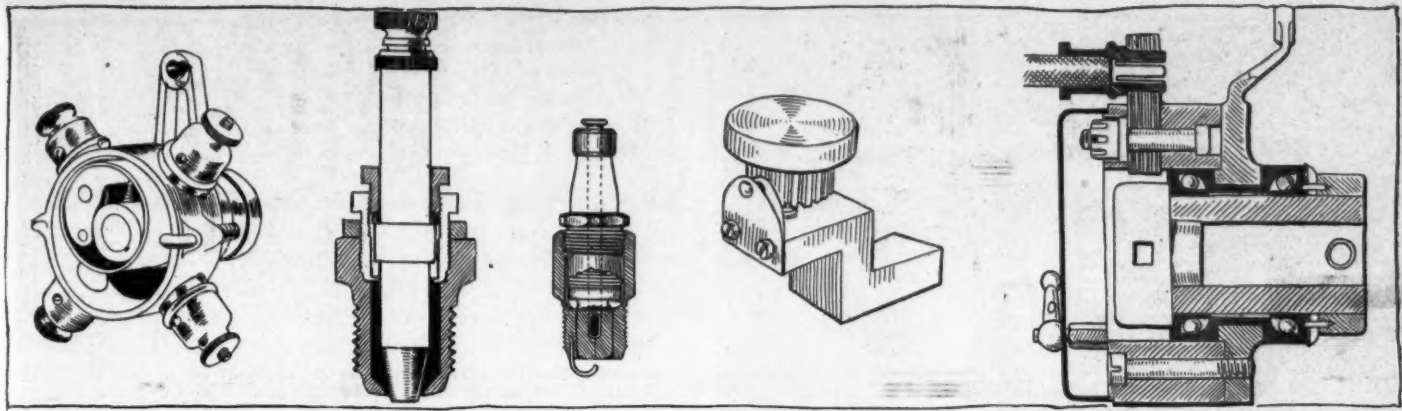
dry battery and a Jones speedometer-odometer. The cabinet was sealed Friday morning by the A. C. A. show committee, with the odometer set at zero, and the generator is running at a speed corresponding to a 25-mile speed of the average car. It will run in this manner until the show closes or the battery is exhausted.

The National Carbon Co., maker of the Columbia dry cells, is distributing a useful little hand book on coil adjustment and battery testing, to which are added a few hints on trouble finding, lubrication and operation generally.

The latest form of Heinze timer has a pair of spiral spring copper blades mounted on the end of the revolving shaft. These wipe on the top and bottom of stationary tool steel knife blade contacts. A slight modification is noticeable also in the Heinze coil trembler. This trembler has a thin steel blade carrying a large and thin soft iron button, and in its new form the blade is extended about three-quarters of an inch beyond the center of the button, where it carries the platinum contact point. It makes contact with a stationary point in the bridge, and the only adjustment is furnished by a shouldered screw passing through a hole in the blade and pressing upward against it with a force depending on the adjustment.

Several interesting novelties are shown by the Witherbee Igniter Co. Prominent among these is a timer of the roller type, but distinguished from others of its kind by the fact that the roller, instead of bearing directly against the surrounding case and the contacts, bears against a wide floating brass ring, which surrounds the roller and its mounting, and makes contact simultaneously with the contact points and the brass case. The contacts are made of tool steel and are backed by springs; they project slightly and are pressed back by the roller, so the latter gives the current a direct pass from the contact points to the case. In other words, the current does not have to pass through the bearings. Another Witherbee novelty is the adjustable spark plug shown in the sketch. The porcelain is packed between two gaskets in the brass bushing B by the gland A, and the bushing is screwed in or out of the shell D to adjust the distance between the steel cone at the end of the porcelain and the internal flange surrounding it, and is locked by the nut C. The Witherbee spark coils embody some ingenious refinements aiming at simplicity and easy adjustment and repair. The coil tops are of porcelain instead of the usual rubber compound, and each coil is provided with an extra contact screw and trembler. The coil sections are readily removable.

A new double ball bearing roller timer is shown by the Connecticut Telephone and Electric Co. The roller is of V section. A new type of distributor and a new magneto switch manufactured by this company also are seen. The latter is intended for use on coils where the double ignition system is used. It has a plug cut out, and is arranged so that the current indicator can be used for adjusting the coil by plugging into the switch. A further Connecticut novelty is an exploring lamp mounted on a handle and having a plug at the end of a flexible cord, so that the lamp can be connected to the batteries by inserting the plug into the switch. The Connecticut coils show no noticeable change, save in the adoption of a dial-adjusting screw, whose head is so graduated that it is possible to adjust



WICO TIMER

WICO AND RELIANCE PLUGS

SPLITDORF ADJUSTMENT

HERZ BALL TIMER

the coil fairly accurately without the use of a current indicator.

Another novelty in ball bearing timers is shown by Herz & Co. in the shape of a spring adjustment. The timer has two ball bearings, thus ensuring stability, and these are of the adjustable cup and cone type. The cups are carried by the steel base ring A, and one of the cone shoulders at the end of the steel tube C. The other cone, instead of being threaded on this sleeve, is slidable, and is pressed against the balls BB by the special spring G, which is held by the collar H. This collar is secured by set screws. The contact K is of laminated tool steel plates, and is reversible as to the direction of rotation of the plunger F.

The Exide storage batteries for ignition show slight changes this year. The terminals have been considerably stiffened to withstand the rough usage of operators, who thoughtlessly use the pliers without regard to the nature of the material upon which they are working. The leather handle used during the past season has been superseded by a handle of rubber webbing, which resists the acid and is much more durable. The individual rubber jars are assembled into a wooden containing case which has been given two coats of an acid-resisting paint. Sufficient clearance is allowed between the jars and the case for a hot compound to be poured around the jars, thus preventing the acid from getting into the case. This same compound is used to finish off the top of the battery, leaving only the terminals and the gas vents exposed. The gas vents are now funnel-shaped, with pin holes at the bottom and sides, so that spray generated during charging runs back into the cell, instead of escaping from the vent. The vent is large enough to permit free inspection, etc., and the terminals are sealed with soft rubber plugs where they pass through the covers.

A decided novelty in soot-proof spark plugs is shown by the Jeffery-Dewitt Co. in the Reliance plugs. The inner end of the porcelain has a long surface as is customary, but this is not relied on to keep the plug from short-circuiting. The positive electrode is a very small platinum wire baked into the porcelain and cut off flush with the surface of the latter. Being cooled by contact with the porcelain, it is claimed to be immune against corrosion or burning by the spark. The end of this wire is so small that it is physically impossible for sufficient soot to be in contact with it to ground the sparking current. The spark jumps in spite of the soot, and its immediate effect is to burn away the soot adjacent to the platinum wire. This action of the plug was demonstrated by the exhibitors on plugs held in a candle flame, and even having their lower ends immersed in water. This interests many persons.

A new synchronizing spark coil set shown by C. F. Splitdorf contains more of novelty and merit than appears at first glance. The set itself comprises four ordinary spark coils without tremblers, but with cut-out buttons over them for testing purposes, and a trembler operated by a small horseshoe electro-magnet. The trembler itself is of a high speed type, and the design of the magnet actuating it is such as to insure great rapidity of charge and discharge. The makers state that they have tested the coil at a camshaft speed of 2,400 revolutions per minute and found the trembler to work regularly at that speed. The regular con-

denser is located under the trembler coil. In addition, each of the spark coils is provided with a Splitdorf supplementary condenser, which is so connected as to absorb whatever spark would otherwise be produced at the timer, thereby giving the timer a much longer life. In addition to the two types of magneto, high and low tension, sold during the past year, a new Splitdorf magneto is now offered which sparks from a separate coil instead of carrying the secondary winding on the armature. Electrically the system is similar to that of the Eisemann magneto.

The Heinze Electric Co. shows a new magneto working on the Eisemann system, for which it is claimed that the field magnets are so hardened that they will not demagnetize.

The K-W Ignition Co. shows a synchronizing trembler, or master vibrator, which is intended for use with the ordinary four or six-cylinder coil sets. It is simply wired into the circuit between the coil set and the battery, and the individual tremblers on the coils are screwed down tight. The same timer is retained. A new K-W magneto is also shown, which is arranged in connection with a two-unit spark coil for four or six-cylinder ignition. A selector at one end of the armature shaft determines the coil through which the current shall flow and the secondary current from the coil is divided between two cylinders, which are respectively compressing and exhausting. The magneto follows substantially the same construction as before but is run at engine speed—one and one-half times engine speed for six-cylinder engines—instead of being friction-driven, and carries a spark timer on the armature shaft.

The principal feature of the Dow Portable Electric Co.'s exhibit is the Komet magneto, which carries the secondary winding on the armature shaft, and in general follows standard lines.

The Kokomo Electric Co. shows no marked change in its spark coils, save a modification of the trembler which is stated to work at higher speed.

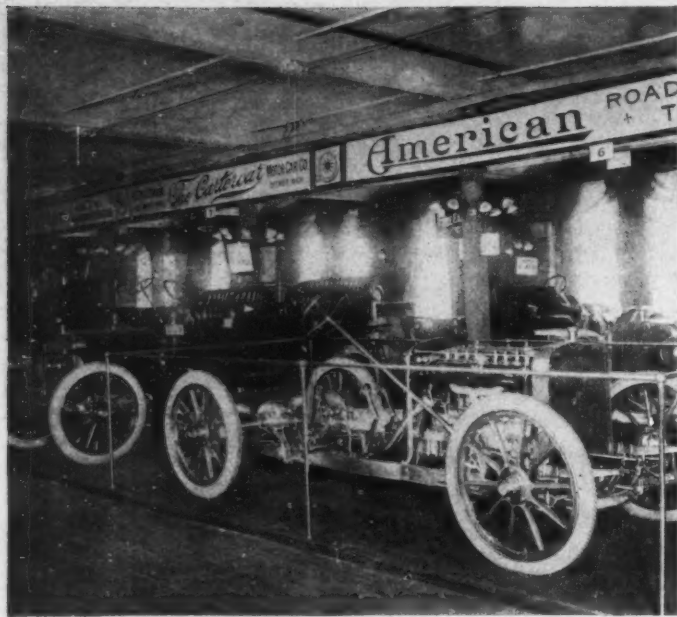
A storage battery shown by Geiszler Brothers is claimed to be non-sulphating, owing to unexplained chemical treatment of the plates. The new model for ignition is lower than previous models, to adapt it to the average battery box.

The National Battery Co. shows a full line of samples but announces no changes for 1908, save for a new process of assembling and sealing which eliminates breakage.

The new model of the Bemus timer runs in cup and cone ball bearings. It is reduced in diameter from former models and is provided with a fixed ball contact at the end of the shaft, in order to give a direct ground for the current.

A new dry battery is the Best, made by the Ampere Mfg. Co. It is claimed by the makers to test 25 to 30 amperes and to have a voltage of 1.6, also not to run down until used.

A new high tension magneto made by the Remy Electric Co. is of interest for its simplicity. It has only one shaft and the primary and secondary windings complete are on the armature. The armature runs at the same speed as the crankshaft and there is no distributor in the ordinary sense. Instead, there is a hard rubber drum on the armature shaft, carrying a simple arrangement of segments, from which stationary brushes conduct a high tension voltage to the spark plug couples. The plugs are



WHERE THE AMERICAN HOLDS FORTH

parallel in pairs, so that the secondary current divides between them, the two plugs thus connected in series thus belonging to cylinders whose pistons are in the same position. In other words, each cylinder gets an idle spark near the end of its exhaust stroke. The simplicity of the arrangement, however, commends it, since the only wiring required consists of a cable from the magneto to each spark plug and the primary wire from the magneto to the switch.

The J. S. Bretz Co. show a German magneto made by Unterberg & Helmle, which is new to the American trade. It follows established lines as regards the winding of the secondary coil on the armature and its principal novelty is a coiled spring by which a hot spark is obtained for starting, no matter how slowly the motor crank is turned. The armature pinion drives the armature through this spring, the normal angular relation of the two being maintained against the spring tension by a stop. When the crank is turned slowly a ball ratchet device engages a fixed stop, thereby locking the armature against rotation until the pinion has reached a certain position and winding up the spring. When the pinion reaches the firing position, the ball is released and the expansion of the spring rotates the armature rapidly. When the magneto is running at speed, the ball is held in an inoperative position by centrifugal force.

An ingenious little refinement in trembler contact screws is found on the Splitdorf coils and is illustrated in an accompanying sketch. The contact screw has a milled head A of the ordinary sort, under which is a short steel barrel B, whose surface is

milled into deep square slots. A tiny steel ball C is held and pressed against these milled slots by the two flat springs DD, thereby locking the screw in position.

A timer made by the Heinze Electric Co. has a radial knife blade mounted on the revolving shaft. This knife blade wipes between steel buttons on the ends of two copper blades. The blades are mounted in a fiber ring, and the whole timer is packed with grease.

A roller contact timer used on the Great Smith car is of conventional design as regards the roller and its carrier. The casing, however, is of cast iron instead of fiber, and the contact segments are of hard steel insulated by bushings turned from $\frac{1}{4}$ -inch round fiber. These bushings are a tight fit in the cast iron ring and the hole is carried at the top of a vertical shaft and runs in oil. This insures a much more reliable contact than if grease were used, and the oil has the advantage that any free metal particles wash down to the bottom and do not ground the segments. The makers state that this form of timer is the result of a great many tests of practically every timer on the market. These tests have been carried out on a six-cylinder Great Smith motor car engine, which supplies power for their factory and runs about 22 hours per day. Another new ignition feature of the Great Smith car is that the spark advance lever, when fully retarded, disconnects the ground wire of the primary circuit, thereby acting like a cut-out button on the steering wheel to stop the engine.

In the De Luxe cars shown, the battery timer is vertical and is driven by a short flexible shaft from a train of small spiral pinions geared to the cam-shaft. The flexible shaft employed is made up of concentric helices of steel spring wire closely wound in alternately opposite directions. The resistance of this shaft to torsion is very considerable; nevertheless, the representative at the stand stated that it was the company's intention to substitute a vertical shaft driven by spiral gears from the magneto shaft. The 1908 De Luxe cars will offer Eisemann or Bosch magnetos at the customer's option, and also will use battery ignition.

Like many other 1908 cars, the Stoddard-Dayton and the Dorris cars are arranged for the addition of magnetos if the customer so desires, in both cases the Bosch magneto being the one chosen. In the Dorris the magneto is driven by a jaw coupling from the rear end of the circulating pump shaft and practically all that is required to install the magneto is to purchase that article itself and a standard bracket to support it, this bracket bolting in place with two nuts. The Stoddard-Dayton six-cylinder car carries a Bosch magneto as part of its regular equipment. This entire department is one of the most interesting at the show and students of electricity put in much time examining the different devices brought out in the last few years to meet the needs of the motor car. Those who are novices at the game find here an excellent opportunity to add to their fund of knowledge and pick up a few ideas.



TWO PROMINENT IGNITION EXHIBITS



SWINEHART AND WINCHESTER STANDS

Bodies AND Tops

THAT the motor car trade has proven a boon to the top material and carriage building trade is evidenced by the number of exhibitors in these different branches. In point of numbers it is nearly a tie between the top and glass front makers, and in the majority of cases the two industries are combined. The top proposition has shown an immense forward stride, particularly in anti-rattle appliances, the method of attaching the bow to the bow sockets, and the substitution of a bow slat iron in place of the usual bow socket. In coverings for these tops the materials used are imitation leather, rubber cloth, whipcord pantasote, chrome leather and hand-buffed leather. In prices there is a very wide range shown, from \$25 to \$200, depending on the maker and material used. One of the improvements in construction is shown in a reinforced bow socket, in which a forging in the socket extends up into the center of the bow, calculated to reduce the chance of breakages. This is shown at the exhibit of the Sprague Umbrella Co. Another device intended to accomplish the same result is to be seen at the Auto Accessories Co. stand in which, instead of using sockets, the forging is made flat and the bow fastened to it by means of bolts. In the Rands Mfg. Co. booth is shown a top which apparently is a two-bow, the front bow being a horizontal one and hidden under the edge of the top, so it can be dropped down.

There are several devices, such as rubber bumpers, lugs and sockets, etc., for holding the bows in line—when the top is laid back in the bow rests. The bow rests are made so the rattle is eliminated and the risk of breaking the bows in rough going greatly lessened. The display of tops by the top manufacturers is small, both in quantities and range of materials, when compared with tops on exhibits of the cars in the main floor. Here are found tops of various shapes on the different types of cars. One very neat one is exhibited on a Continental, the lines of which are said to have been copied from an old chaise, which dated back to Washington's time. The greatest objection to an adjustable glass wind shield has been the tendency to rattle after a certain amount of usage. This glass front proposition, being an offspring of the motor car industry, is young yet, still in its short life great advances have been made. These are made principally of glass and metal, though wood is sometimes used instead of metal for frames. These metal frames are finished in imitation of wood. One objection to the metal frame has been the difficulty of making a tight fastening for the glass. This has been overcome in one case by the use of a rubber gasket in which the glass is bedded, making a practically anti-rattle construction. The aim of the wind shield makers is to obtain a partly detachable device or one in which the upper half may be detached or lowered. Different manufacturers obtain this in various ways. One very simple device is that of the Voltz. The upper half fits into a groove in the standard on each side of the lower glass and is held in place by a set screw. This upper half, when not needed, fits into a tapered bracket beside the lower half and is held firmly by the same set screw. The same concern which exhibits the Volts also show the Schildback and Beecher. Another novelty is the Troy combination, which has a bug screen to replace the upper glass when removed. Both the bug screen and glass can be lowered together. Several other exhibitors have wind shields on exhibition, all of them of the adjustable anti-rattle type. The prices range from \$30 to \$100.

The Nathan Novelty Mfg. Co. has an exhibit of tire and lamp covers, coat rail bags, spark plug and tire and tool cases, knuckle, cardan joint and thrust boots, and also shows a large carry-all tire trunk, with a capacity for two large tires, tools, inner tubes, etc. This tire trunk is designed to be carried on the running

board. The Merchant & Evans Co. is showing a metallic tire case with a two-tire capacity. C. Cowles & Co. show some novelties in body fittings, among which is a lock handle for limousine doors, which handle is seen on the Welch limousine.

In the body section there is but one exhibit, that of J. M. Quimby & Co., who are showing some luxurious specimens of the body builders' art. The bodies on exhibition are a roadster, touring car, semi-limousine and limousine. This semi-limousine has the largest tonneau of any car on the floor, with a seating capacity of five persons and unlimited leg and foot room. All of these bodies are built of sheet aluminum over a wood frame.

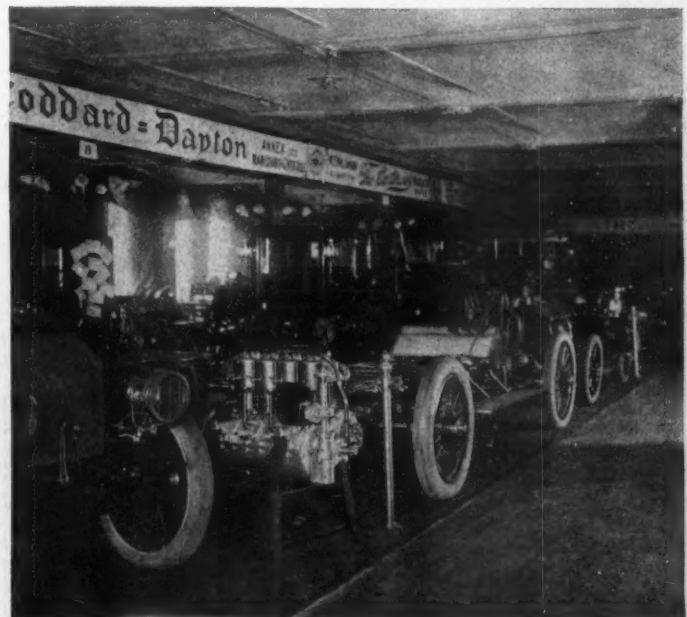
There seems to be a decided tendency toward metal bodies built over either wood or metal frames. There are also examples of the cast aluminum body. One striking novelty in body construction is a combination demi-limousine, convertible into a limousine, the change being made by taking out the glass side windows and frames and the upper half of the door. The tourabout on the Chadwick is one of the most striking artistic body designs shown and a study of it brings a thought that possibly many designers are making the back of the seats too high.

Some of the designers are getting their large tonneau effect by allowing the body to greatly overhang the rear wheels. The general tendency is toward a five-passenger tonneau and a number is equipped with disappearing seats, while others use the revolving seats. The exhibit of the Hill Mfg. Co. shows a variety of revolving seats and detachable chairs.

The trade seems to have adopted the names of the runabout for a two-passenger vehicle, roadster for a three-passenger and tourabout for a four-passenger vehicle. The Wayne and Allen-Kingston roadsters are convertible, the seats being attached to the top of the tool box by means of wing nuts inside the cover.

While there are several limousines on exhibition, the landaulet type is more prominent than at any previous show. The Stoddard-Dayton is showing a taximeter cab, also a doctor's coupe in addition to a large line of touring cars, roadsters, etc. The National has the most conspicuous type of body painting. This is on its runabout, the lower panels of which are painted in Scotch plaid effect. The tendency to have a special color has departed with the one style of striping so prevalent formerly. All kinds of striping effects are now seen. While there are a few red jobs in the show it is not by any means the prevailing color. A most attractive color is the crushed strawberry tourabout in the Chadwick exhibit.

One new type of wood construction is the laminated wood body of the Gearless six. This is said to be as impervious to checking and cracking as is aluminum.



TASTY EXHIBIT OF STODDARD-DAYTON CARS

Tires and Tire Accessories

THE most noticeable tendency observable this year among tire makers is toward a general extension of the line of tires, that is, several of the large manufacturers are now making tires of the Goodyear or Dunlop quick detachable section without beads as well as standard clincher tires, tires with flat and round treads, and tires with the Midgley anti-skid tread—in fact, a full line of pneumatics to fit all popular styles of rim, including the Fisk mechanically-fastened. At the same time the quick detachable rims are made with reversible construction to take both clincher and Dunlop or Goodyear type tires.

A good example of the extension of the tire line is the exhibit made by the Goodyear Tire and Rubber Co., of Akron, which is showing a new detachable tire to fit the Fisk rim without any alteration. The construction is practically the same as in the Goodyear detachable made with the contractible steel tape in the edges. In this tire, however, the solid base of the Fisk tire is eliminated. In addition to the universal detachable rim, which is made with interchangeable endless beads of two forms to take either the Goodyear detachable tire or any standard clincher tire, a special rim is being shown for use on electric vehicles, being made on the same principle, but a good deal lighter for the sake of economy.

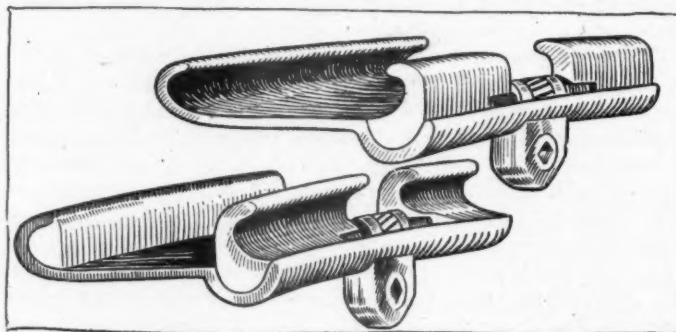
The Fisk Rubber Co., of Chicopee Falls, Mass., has added to its line a quick detachable tire to fit any quick detachable rim and also a tire with clincher beads, so that it now has a complete line of tires to fit any style of rim. Slight changes have been made in the Fisk removable rim, which was brought out last winter at the Madison Square garden show, and the company is now experimenting with a view to forming the permanent base of the rim of hollow metal to reduce the weight materially.

An oval raised tread tire has now been adopted as standard section by the G & J Tire Co., of Indianapolis. It is furnished in clincher form, while the round tread is supplied in both clincher and Dunlop patterns. The company is making only a wrapped tread tire cured in one heat in one operation. The line includes tires with the Midgley non-skid tread in both clincher and Dunlop form.

A quick detachable tire made like a Dunlop, over a cable of piano wire in each edge, but with clincher beads to fit quick detachable rims, has been added to the line of the Hartford Rubber Works Co., of Hartford, Conn. The company is push-

ing this, together with the improved Midgley rim, which is now made of two parts instead of three. The removable part is a reversible flange ring, flat on one side for the straight side Dunlop or Goodyear form and with clincher flange on the other. Instead of employing a removable flange ring on the other side of the rim, an endless gasket made of canvas and rubber is supplied to fit in the flange of the permanent rim, filling it up so as to present a flat side corresponding with the shape of the flat side of the removable ring or bead.

The Marsh quick detachable rim, used with the tires of the Diamond Rubber Co., of Akron, is made doubly heavy this year, the base being made of thicker metal, the clamping ring heavier and the bolt $\frac{1}{2}$ -inch in diameter instead of $\frac{1}{4}$ -inch. The expanding wedge is also larger and the lockout bigger,



IMPROVED MIDGLEY RIM

so now it is possible to manipulate the rim without the use of any tools except a small wrench to tighten the nut. An addition to the line of Diamond tires is a raised tread anti-skid tire, in which specially hardened rivets are inserted separately through the rubber and eight plies of fabric under hydraulic pressure and secured by washers. A four-ply breaker strip is now inserted in the raised tread tire. The Diamond company also has taken up the manufacture of Fisk and Dunlop type tires in all sizes. The Diamond electric tire is a new one.

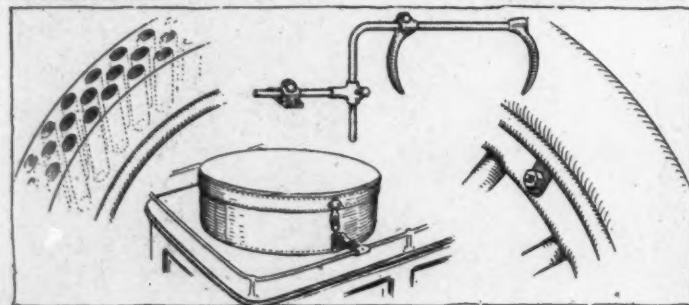
A new improvement in the pneumatics of the Firestone Tire and Rubber Co., of Akron, is the 1908 Firestone dual non-skid tread, which consists of two flat ridges of rubber extending around the tire and having their surfaces corrugated to afford further protection against skidding. The tread is thicker than the regular Firestone wrapped tread. The 1908 Firestone dismountable rim is a new addition to the list of removable rims. It may be used with any clincher tire.

The new two-part Midgley rim, with one reversible metal bead with turnbuckle feature, and a removable rubber gasket for use with Dunlop tires, is now supplied with the tires made by Morgan & Wright. The company also is showing a new size, 40 by 4 inches, made with either Bailey or plain tread.

An entirely new style of tire has been brought out this season by the Swinehart Clincher Tire and Rubber Co., of Akron. This is a cellular tire for heavy touring cars. It is made of solid rubber, nearly square in cross section, with flat tread, and is molded with many large holes extending downward nearly to

SWINEHART TIRE

ALLEN TIRE HOLDER



NATHAN TIRE CASE

DIAMOND TIRE

the base. Instead of being radial these holes are tangent to the center of the wheel, so as the tire rolls on the road the compression of the rubber closes the ends of the holes.

At the stand of the B. F. Goodrich Co., of Akron, it was said that later in the week there probably would be something new on exhibition, but no information regarding the nature of the surprise would be given out in advance. The line of Goodrich tires otherwise remains the same.

A brand new line of tires is exhibited for the first time by the Home Rubber Co., of Trenton, N. J. These are made in detachable and standard clincher form, with round and flat treads. They have been in the market about 3 months.

All Michelin tires, made by the Michelin Tire Co., of Milltown, N. J., are now made of oval section with straight side walls, except the flat tread and anti-skid tires. The tread of the oval tire is slightly corrugated to reduce skidding.

A line of Empire clincher tires and tire appliances is shown by the Empire Automobile Tire Co., of Trenton, N. J.

A line of Genesee tires is exhibited for the first time by C. J. Downing, manufacturers' agent, of New York. These are made for the Thomas D. Buick Co., of Flint, Mich., and have round treads. Mr. Downing also shows a novelty in the form of a tire relining, which consists of four plies of anti-friction fabric molded to the contour of the inner surface of a tire shoe.

Somewhat similar in purpose is the blowout patch made by the Traver Blowout Patch Co., of New York, and exhibited for



STANDARD PROTECTOR NEWMASTIC SHAW SELF-HEALING TUBE

piece clincher rim cut into two equal parts by the removal of about $\frac{1}{4}$ inch from the center all the way around.

A chrome leather inner tube is a novelty shown by the Leather Tire Goods Co., of Newton Upper Falls, Mass. It is soft and pliable and is made with an ordinary rubber air tube inside. The whole affair goes inside the tire shoe like an ordinary tube, the object of the leather tube being to protect the rubber from pinching or puncturing on some small splinter or pin point sticking through the casing. Buckle straps are used on the 1908 Woodworth tread, which also has studs made with special hat heads. The new Woodworth tire sleeve is now made with a continuous leather strap for attaching which has only one buckle.

An automatic adjuster is a new attachment for use with Weed chain tire grips. It consists of four small helical springs having hooks at one end and eyes at the other. It is attached by means of the hooks to the side chain of the tire grip, and a small chain that passes through the eyes of the four springs puts a tension on them in the direction of the hub of the wheel.

The Nathan Novelty Mfg. Co., of New York, which is a new exhibitor at the shows, displays a new carryall tire trunk to be placed on the roof of a car and strapped to the rail.

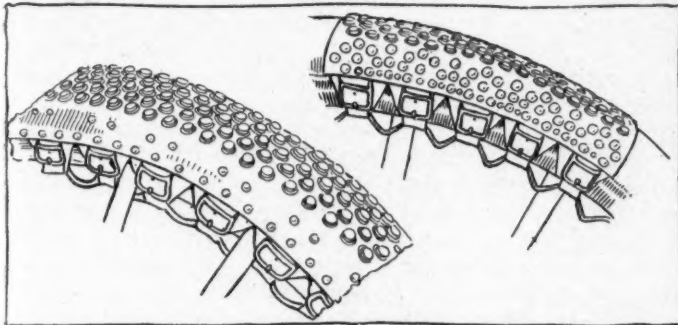
An interesting tire protector never before shown is displayed by the Norris Auto Parts Co., of Saginaw, Mich. It resembles an ordinary shoe cut off on both sides above the clincher beads, but has stiffening beads on either side.

A vulcanizing substitute for emergency work is exhibited by Charles E. Miller, of New York. This is a rubber cement with an acid cure which when applied has a similar action to vulcanizing by heat.

A new universal tire holder is one of the newest articles in the line of tire specialties made by the Allen Auto Specialty Co., of New York. It is made with adjustable bracket and extension rod so that it can be fitted in any position on the car.

The Long & Mann Co., of Rochester, shows a new dismountable rim made in two parts, the removable section having studs that engage in diagonal slots in the permanent portion.

About the latest innovation in tire pumps is the Spencer power air pump, displayed by the Auto Pump Co., of Springville, N. Y. This is made with handles at either end and a squared driving shaft that fits in a socket in the hub of the starting crank of a car. All the work of pumping is done by the engine.

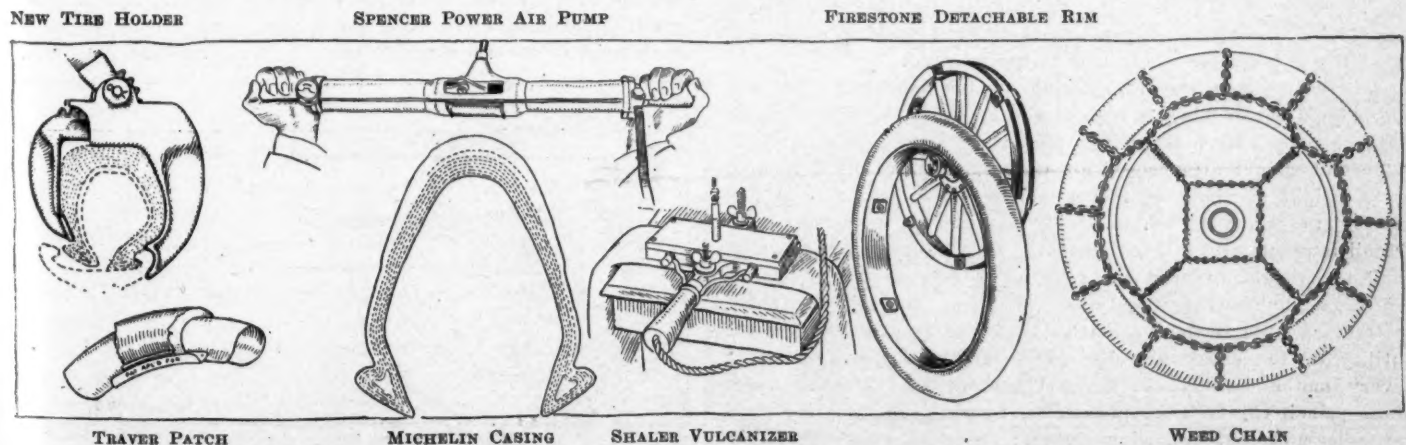


BUCKLE STRAPS USED ON WOODWORTH TREAD

the first time, having been patented only last September. The patch is a foot or more in length, made of rubber-covered canvas molded to the shape of a tire section, and having an angle strip of brass copper riveted to one side. This patch is inserted between tube and shoe wherever a weak place develops.

A new tube just put on the market by a new company is the Shaw self-sealing inner tube, shown by the Automobile Utilities Co., of Boston. The tube is made double on the tread side and is filled between the layers of rubber with a composition of melted rubber and asbestos fiber which remains in a plastic state and instantly fills any puncture that occurs.

In addition to its Newmastic tires and filler, which have been in the market for some time, the Newmastic Tire Co., of New York, is showing a new detachable rim which consists of a one-



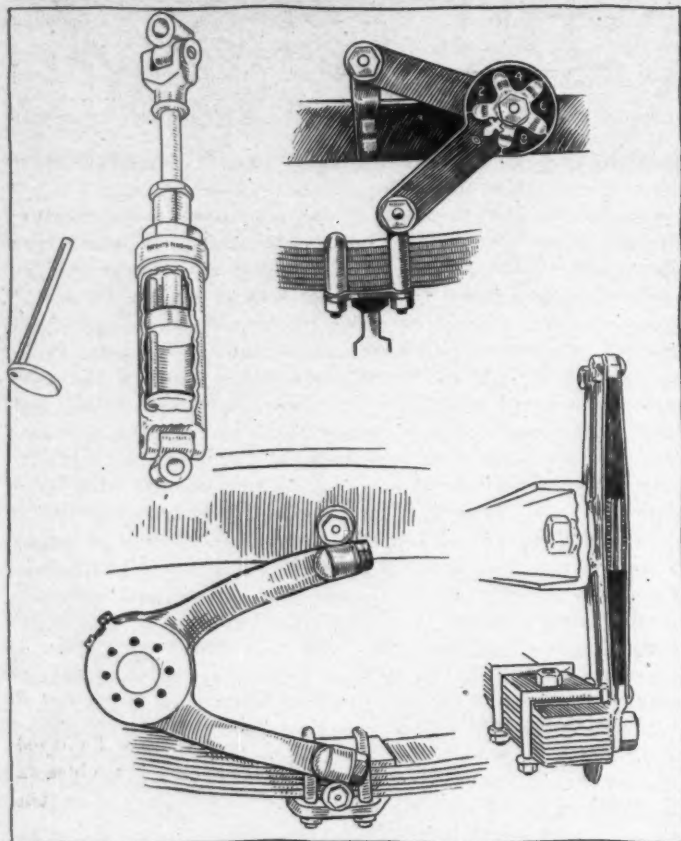
TRAYER PATCH

MICHELIN CASING

SHALER VULCANIZER

WEED CHAIN

The Shock Absorbers



HARTFORD, COMSTOCK, DIEZEMANN AND GABRIEL

SHOCK absorbers are essential adjuncts to a well-equipped car and are much in evidence at this show, not so much on the car exhibited as in the booths of the various shock absorber manufacturers. The Marmon, Frontenac and Stoddard-Dayton six are the only ones that include them as a regular equipment. The function of a spring is to absorb the road shocks and jars, or, in other words, to permit the wheels to go over a bump or obstruction without raising the body of the car more than is necessary. It is impossible to get a spring that will work slowly enough, as after the compression there are a number of vibrations from the recoil, and the more vibrations the more the tendency to crystalize, and consequently break the springs. There is a decided difference of opinion among the makers of shock absorbers as to the best method of doing the work and also as to the work that is to be done, some claiming the springs should be allowed to compress to their limit without check and that the check should only act on the rebound.

One very clever way of showing what a shock absorber will do after a severe blow is seen at the booth of the Victor Shock Absorber Co. Here there is a pile-driver arrangement with an 80-pound weight attached. This weight, which is made to drop at a height of about 40 inches, comes down on a full elliptic spring to which a Victor shock absorber is attached. The recoil is practically nil, but when the shock absorber is detached and the weight dropped the rebound is very high and with a continued number of vibrations. This test, made in the show, attracts a good deal of attention, and clearly demonstrates the utility of the shock absorber as a part of the equipment of every motor car. These shock absorbers are actuated under four principles—friction, pneumatic, hydraulic and spring—and are shown by the following makers: Friction class—Truffault-

Hartford, Diezemann, Pater-Noster, Shoesorber and Gabriel; hydraulic class—Victor, Comstock and Hotchkiss; spring class—Sager, Stolp and Supplementary Spring.

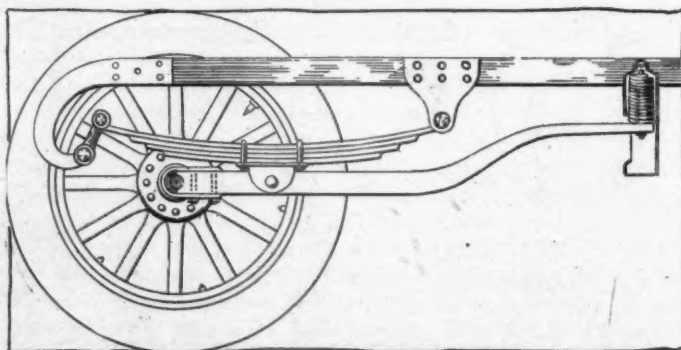
The Truffault-Hartford has made a few changes on the '08 model, one of which is simplifying the ends of the arms and furnishing connections to attach the devices to the motor car. A graduated adjustment is another new feature—by means of which each of the four shock absorbers on the car can be adjusted to the same amount of friction. This device is well made and the friction surfaces are entirely covered, making it water and dirt-proof. A special preparation on the wooden friction surface eliminates the necessity for lubrication except where the arms are attached to the axle and frame. The Gabriel is another of the friction type, but with a straight instead of a rotary motion, and one of its claims is the perfect freedom of the springs under slight normal conditions, but an increased friction the more the play of the springs, both on the compression and on the recoil.

The Diezemann is of the friction type, with a rotary motion, and has universal joints where the arms are attached to the frame and springs. The new model, while it contains all the features of the old one, has an arm to each friction surface, which arms are attached to the spring and frame of the car. It is adjustable, and once lubricated needs no further attention.

In the hydraulic class is the Hotchkiss, which was mentioned before in connection with the road test. The visitors are attracted to this exhibit by a large Teddy bear, which cannot be bounced out of a seat because a Hotchkiss anti-jolt device safeguards it. This device consists of a cylinder, which is attached to the spring. This cylinder contains a rotary piston on a shaft which is fastened to the frame of the car by means of a lever and link. There is a partition wall in the cylinder through which an adjustable hole in the piston forces the glycerine.

Another hydraulic is the Victor, but this one has the straight up-and-down motion instead of rotary, and consists of a cylinder to be attached to the springs. In this cylinder is a piston, which through a piston rod is fastened to the frame of the car. Each end of the cylinder is connected by a by-pass in which an adjustable screw regulates the flow of liquid from one end to the other. This adjustment is for weight. In the cylinder is a double-tapered groove, the widest part of which is against the piston when it is in a neutral position. This allows an easy flow of liquid to pass the piston at normal work, but the longer the stroke, the smaller the groove which prevents a severe compression or recoil of the springs. In the Supplementary Spiral Spring Co.'s exhibit are shown its springs, which are designed to take the place of spring links and add flexibility to the springs of a car, doing, to a certain extent, the work of a shock absorber.

The Sager equalizing spring is another spring device which is said to be a good thing for bad roads, and not a bad thing for good roads. It is fastened at a neutral tension between the axle and spring and, working against the compression of the main spring, checks it as well as the rebound stroke. The Stolp guaranteed shock absorber is the combination of a long lever and spiral spring. It consists of a long lever fastened at one end to the frame of the car through a spring. At the other end it is fastened to the axle and a few inches from the axle it is clamped to the main spring seat.



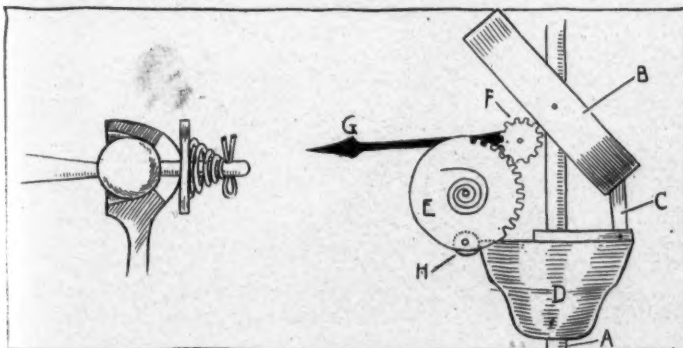
STOLP'S NOVEL SHOCK ABSORBER

Speed Measuring Devices

THE transmission driving gears of the average speedometer wear out faster than almost any other part of the car except the tires, and a number of improvements aiming at this feature are shown. The skeleton pinion of the Warner Auto-meter is already familiar. In the Springfield Motometer substantially the same result is attained by making the bottoms of the spaces between the teeth knife-edged, thus permitting mud lodging on the pinion to be easily forced out from between the teeth. The Motometer pinion shaft is carried in a pivoted bracket held in its normal position by a spring which yields under pressure. The Motometer flexible shaft has received additional protection against short bends at either end by the addition of a spring-tempered flat steel coil. The shaft itself and its spiral containing sheath likewise have been improved, the latter by the use of oil-tempered spring stock. Other new features of the Motometer are a maximum speed indicator and a new scale of unusual legibility. The maximum indicator traverses the vertical scale of the regular indicator, but remains at the maximum speed attained until released by pressing a button. In the Warner Auto-meter a change in mechanical construction is the substitution of spiral for bevel gear drive from the pinion to the flexible shaft. The spiral gears are case-hardened and run in grease. The lower portion of the flexible shaft runs in a curved brass tube, rising from the second or vertical spiral gear shaft, and further protection against short bends is given by a stiff leather casing.

A well-made instrument of the centrifugal type is shown by the Hicks Speed Indicator Co. It is virtually a two-ball governor, but it is distinguished by the fact that the governor, instead of working against a single spring, works against three springs in succession, and each spring is separately adjusted. The springs are arranged in series so that the governor works first against one, then against two, and finally against all three. The arrangement is intended to give an approximately uniform graduation on the dial, instead of a graduation varying considerably from one end to the other. Combined with the speed indicator is a Veeder odometer, which is enclosed in the same case, and a clock with an Elgin movement, also in the case.

The exhibit of the Veeder Mfg. Co. comprises its regular line of odometers and tachometers and the two instruments combined. As is well known, the tachometer operates on the principle of a column of liquid elevated by the pressure of a centrifugal pump. The pump is located in the lower part of the instrument and has paddles of two diameters, which run in a casing which closely surrounds them. According to the position of a two-way valve, the column of liquid in the tube is in communication with the space around the smaller or the larger set of paddles. Thus two readings are provided, one of double the scale of the other. A plunger partly immersed in the liquid in the chamber above the pump is moved up or down to bring the level of the liquid to the zero mark in the tube.



DE LUXE LEVER CONNECTIONS

EVER READY TOUROMETER

The Loring speed-gauge is only slightly changed from previous models. A sapphire pivot has been introduced at the point where rotating motion is converted to straight line motion. Re-enforcements are provided to avoid sharp bends at the ends of the flexible shaft. The bracket carrying the driving pinion is hinged and will swing clear without damage in case a pebble or stick gets into the gears.

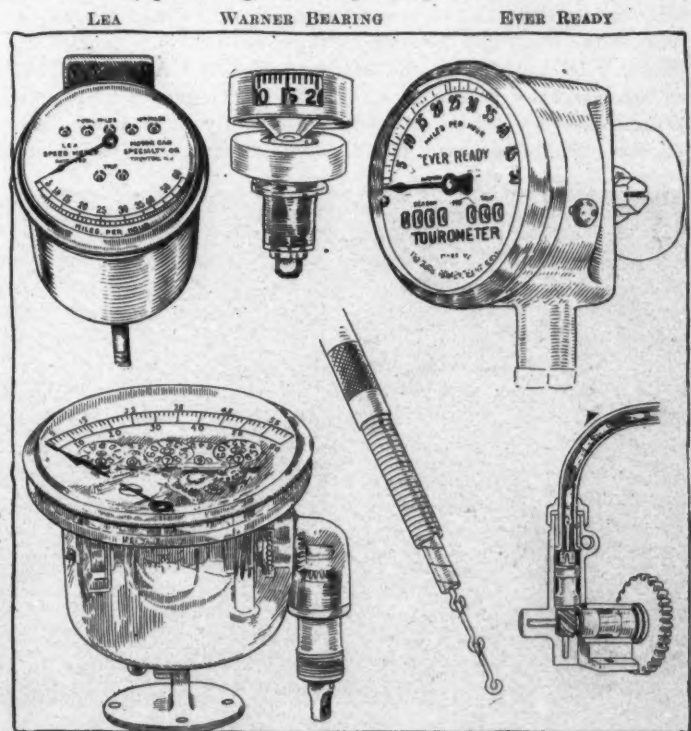
A new speedometer, the American, shown by the Stewart & Clark Mfg. Co., differs from the standard Stewart speedometer chiefly in the omission of the bevel gears through which the latter is driven from the flexible shaft.

The Index speed indicator, made by the Index Speed Indicator Co., formerly the Oliver Instrument Co., is changed from last year's instrument only in that it registers forward regardless of the direction in which it is run. This applies also to the odometer contained in it. The Index flexible shaft is of somewhat unusual construction, consisting of a series of links of steel rod with slotted ends, connected by loops of bent wire.

A new speedometer called the Standard, made by the Parker Mfg. Co., is so constructed that the scale is uniform from one end to the other. The mechanism consists of a pair of weights attached to two cog wheels which actuate the pointer through a rack and pinion movement. The feature which is relied on to give a uniform graduation is the change in leverage exerted by the small springs on the arms attached to the cog-wheel arbors.

The Jones Speedometer Co. makes a concession to the popular demand for a low priced speed indicator in its three new models. All of these use Veeder odometers mounted at the side of the cup. The higher priced instruments are unchanged except for the addition of a maximum speed indicator.

The principle of the Ever Ready tourometer, made by the Auto Improvement Co., is indicated in the accompanying sketch. The central spindle A runs at the speed of the flexible shaft and carries on it the pivoted brass ring B, which is normally held by a spring in the position shown. The lower part of this ring is connected by the flat link C to the steel cone D, which slides on the shaft and turns with it. A light cog wheel E, whose arbor is journaled in a stationary bracket not shown, engages a small pinion F. The front end of this arbor carries the index hand G. A light arm projecting backward from E carries the round steel piece H, which is pressed against D by a spiral spring attached to the arbor of E. As D is raised by the increase of speed, the spring causes E to rotate slightly to the left, keeping H in contact with D, producing a corresponding movement of index G.



NEW STEWART AND ITS SHAFT

WARNER SHAFT



THE modest gong which once warned the foot passenger of the coming of the little horseless carriage finds no place in the show of 1908, having given way to the more imposing horn, the siren or the musical chimes. The horn has grown in size and importance with the car, until the new patterns present a variety of complicated convolutions, with a corresponding improvement in volume and character of sound.

The exhibit of Tripari Brothers & V. de Prisco Co., of New York, includes some interesting examples of brass-working, notably the Gemelio, a double horn with twin bulbs and tubes, one on each side of the car. This horn has two convoluted bodies with a single mouthpiece, but the Siamese pattern of double horn has but a single body with double mouthpieces, giving a chime effect. The chimes pattern is another form of double horn, with two mouthpieces back to back. There is something very suggestive in the name Bullfrog for a horn of compact proportions and very deep tone.

A novelty in bulb horns is the Python, an imported horn shown by Post & Lester, the body being a plain spiral like a coiled serpent and the usual bell mouthpiece being replaced by a small brass bulb in the center of the coil, corresponding to the serpent's head. This bulb is pierced with a number of holes about $\frac{1}{8}$ -inch in diameter through which the sound is emitted. There is no deadening effect such as is experienced when the bell of the ordinary horn is forced against a strong wind, but the sound is thrown out freely under all conditions.

In the power horns the Gabriel remains unchanged from previous years, its widespread use having revealed no defects which call for remedy. The Autochime, made by the Gray-Hawley Mfg. Co., is a single horn operated from the exhaust by means of a special cut-out valve, or by steam or compressed air. The sounding apparatus includes a cup-shaped bell, a central stem with three ribs so spaced as to produce three separate tones, and a surrounding cylinder of drawn brass. The operating valve is attached to the end of the muffler and has two circular openings with a single disk valve sliding across and opening and closing either. The exhaust is admitted to any desired extent to the horn, the remainder finding its way out through the muffler. In addition to the standard size, the Autochime, Jr., is smaller, 2 by 9 inches, with a slightly higher pitch; while a still smaller size, the Midget, has recently been added, only $1\frac{1}{4}$ by 5 inches but with ample volume of tone, low-pitched and

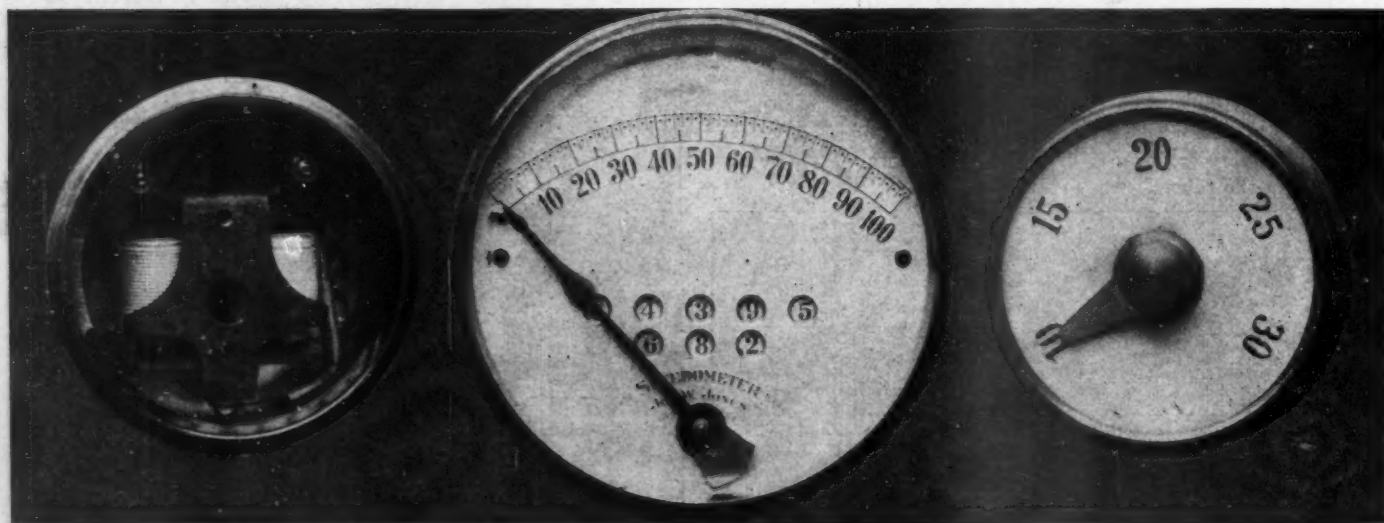
musical, for a small launch or a motor cycle. In connection with these is the Gray combination muffler cut-out and safety-valve, giving relief when a charge is exploded in the muffler.

The Nightingale, known in France under the name of Le Rossignol, is an imported horn of simple construction and with a pleasing and melodious sound that is audible at long distances; it is easily fitted to any car and operated from the exhaust. The National siren horn is a new device, shown by William S. Jones; the running parts fitted with ball-bearings, the exterior form showing a handsome design.

For communication between the riders in a closed body and the chauffeur the Saxon Lamp Co. is making the Saxon auto annunciator, the keyboard within the body showing ten orders: Right, Slowly, Go On, Club, Follow, Go Back, Home, Stop, Faster, Left. The exterior portion of the device includes an electric bell to attract the chauffeur's attention and a box with a glass cover on which the orders are thrown by electric light. The Hicks Speed Indicator Co. is showing a similar device.

A new and interesting form of check on reckless chauffeurs has been devised and is exhibited by Joseph W. Jones, of New York, manufacturer of the Jones speedometer. This is made up of a dial, attached to any desired part of the car, and marked off in figures standing for miles per hour and having an adjustable pointer and an electrical cutout, which may be made to work on the ignition current or on the throttle of the motor as the purchaser may elect. The hand on the regulator dial is set opposite the figures indicating the rate, in miles per hour, which has been decided upon as the maximum. When the driver brings his car up to the speed so indicated the automatic cutout comes into operation and the engine stops, either for want of ignition current or because of a closed throttle, and cannot start again until the car comes down below the maximum, when normal conditions will again obtain. The regulating dial can be placed in any convenient place—for instance, in the tonneau, where it can be operated while the car is running and the chauffeur kept in check by the turn of the little knob. One of the beauties of this system is that the car can be sent out without the owner, with the instrument set, and the chauffeur will be held down to the desired speed just as effectually as if the owner were on board. The manufacturer states that the instruments have proved reliable and effective in a series of long and hard tests and the liability to derangement is very small indeed.

A little device to show how many hours a day a motor car is used is exhibited by the Model Mfg. Co. It is known as the Timograph, and consists of a revolving disk run by clock work. Over the surface of the disk is a needle which traces a mark on the dial when the car is traveling, the vibration of car being sufficient to cause contact between the tracing needle and the disk. There is not any connection for driving it from the car, however.



THE THREE PRINCIPAL ELEMENTS IN THE SPEED-CONTROLLING DEVICE OF JOSEPH W. JONES



FIRST the car—then the costume. This is the natural sequence in the mind of the motorist. Perfect enjoyment of the former is very largely dependent upon the comfort and suitability of the latter, as anyone knows who has been motoring on a hot, dusty day without some sort of a light duster, or on a sharp, frosty night inadequately clad. If one has taken the trouble to visit the exhibits of motor garments, he will be impressed with the fact that the importer and manufacturer of such apparel are not to blame if motorists are either uncomfortably or unbecomingly attired. There are materials for all sorts of weather and styles for all sorts of people.

Among the latest fall productions the fur garments exhibited by the Scandinavian Fur and Leather Co., of New York, are conspicuous. One of the newest and handsomest of the coats for women is of hair seal, having a hood lined with brown glossee kid attached. Fullness is added to the body of the coat by means of an inverted box plait in the back and around the bottom, and a piece giving the effect of a flounce about 12 inches in width is set on for the same purpose. The sleeves are loose at the top and plain at the wrist, finished with brown kid cuffs. Another stunning coat is of civet cat, with a broad lynx collar, cut extremely loose. And another, very similar in style, though of much rarer material, is of Japanese colinsky with lynx collar. In cloth coats this same company is showing several which are distinctly new. A man's coat is of gray melton, cut unusually large, so the driver may not be hampered in any of his movements. For women there is an evening cloak of cream, green and tan striped cheviot, with cuffs and collar of green cloth. This is three-quarters length and is lined with thibet throughout. Something entirely distinct is a gray and white cheviot unlined coat, fashioned so that it may be worn with comfort over a heavy undergarment of cloth or fur by having unusually large armholes and under-arm pieces. The armholes and extra fullness under the arms may be plaited over a large plait and secured by three large hooks and eyes when an undergarment is not needed.

Among the new materials for lighter weight garments is the Priestly cravenetted Roseberry cloth of English manufacture. Garments of this fabric are shown by Leon Mann & Co., of New York. As its name implies, this material is rainproof. It is lustrous in finish and it is shown in many colors and designs.

In this same class come the Hygrade coats, made by A. G.

Hyde & Co., and exhibited by the Regal Coat Co., of New York, this year for the first time. Perhaps those of lucenta satin are the most popular among the Hygrade garments, which are scarcely distinguishable from and said to be much more serviceable than silk and cost only one-third as much.

The latest importation from Paris shown by the Scandinavian Fur and Leather Co. is a combination lap robe of French dog fur and cloth. In mild weather the cloth part may be detached from the fur and used separately. In cold weather the fur may be used by itself or combined with the cloth robe. Along the edges of the fur part are brass staples about 4 inches apart, while at similar intervals on a flap along the edge of the cloth robe are brass eyes. Into these eyes the staples fit and a leather strap passed through the staples holds the two securely together.

Other novelties shown by this company are leather hip boots, fur lined, with the tops in two pieces, back and front, so they can be drawn on like trousers and fastened at the sides; fur-lined leather combined overshoes and leggings for women; a woman's cap, tourist style, made of white lapin with flaps which when fastened under the chin give excellent protection to the ears and back of the head and neck against the iciest wintry blast. Another cap, fashioned of cravenette and black leather, is made with cape and ear flaps. The cape, covering the neck, prevents any dust or dirt from getting down one's collar. There is a new mask made with goggles and an extra piece over the nose, of tan kid and lined with silk. The goggles, chin piece and ear pieces are fastened on by means of ball and socket buttons, so that they may be worn or removed as desired. A white silk hood for evening wear is made with fluffy ruffles of chiffon about the face and neck; and there are many exquisitely painted chiffon veils for evening wear in all the delicate colors, just from Paris.

Morrison, McIntosh & Co., of Grinnell, Iowa, are using a new idea on their Grinnell Rist-fit ventilated gauntlets. It is an adjustable leather strap, which, by means of a snap button, fastens securely about the wrist, holding the gauntlet firmly up on the sleeve.

In goggles there is not much to be found that is conspicuously new. The Julius King Optical Co., however, is offering Gogglette No. 2, which presents several unique advantages over the original Gogglette No. 1, chief of which is that it may be taken apart and the lenses changed in a twinkling while en route, without tools, substituting for the white lenses either amber or smoked ones. The manufacturers of the Gogglette are ready to grind these lenses to prescription, so they will fit the wearer's eyes. The little chain between the two lenses may be easily adapted to the pupillary distance by eliminating links. With all these from which to choose the motorist has no need to be inadequately equipped to thoroughly enjoy the sport, be it summer or winter. It is simply a question of money.



SOME OF THE SCANDINAVIAN COMPANY'S NEW THINGS FOR WINTER DRIVING



SO MUCH has been done within the past 3 or 4 years in lighting the way of the motor car by lamps and searchlights of the highest power that no important advance has been found necessary during the past year. Once equipped with satisfactory methods of handling the various illuminants, oil, gas and electricity, and with the highest skill of opticians and lens makers to aid them, the lamp manufacturers now have had time to deal with minor, but nevertheless important, details of construction. The new lamps of 1908 show frames more solidly constructed, with parts well seamed and flanged together to withstand the jar of fast running, and at the same time accessible for cleaning. New and better locking devices for doors and oil reservoirs are found and most of the defects which were incident to the evolution of the motor lamp from the carriage lamp have at last been eliminated.

The Badger Brass Mfg. Co., maker of the Solar lamps, having secured the exclusive rights for the United States to the Beasard system, is showing this powerful light, with the eclipsing arrangement which is necessary to lessen its brilliancy in city use. The mirrors now made for the Solar lamps by Bausch & Lomb are ground even deeper than the navy standard.

The Neverout exhibit of the Rose Mfg. Co. has as its principal feature the new double-focus searchlight, with two burners, the light from the forward one being projected straight ahead in a series of powerful parallel rays which light the road; while the light from the rear burner is thrown to the sides by the front section of the mirror lens reflector, lighting the borders of the road.

The Edmunds & Jones Mfg. Co. is showing a new construction of its well-known lamps, all parts strongly united by seaming and flanging and with new fasteners that prevent rattling and working loose. The bodies are shown both in polished brass and black. The popular small runabout has come in for its share of light in a small but perfectly made side lamp of square pattern and good design.

The Phoebus lamps of the Manhattan Screw and Stamping Works include all classes of gas and oil searchlights, sidelights, etc., the new Light Magnifier lamp being very simple, compact and strong. The Phoebus lamps are fitted with the mangin mirror reflector or with the parabolens. Saxon lamps are shown in the usual variety of searchlights, headlights and sidelights, a decided novelty being a special clock-lamp, 5¼ inches high, 3 inches in depth and with 4-inch front, the glass face carrying the hours, with hour, minute and second hands as in a watch. The Atlas lamps of the New York Auto Lamp Co. show improved details of construction, including a new spring catch on the Alpha model.

A novelty that will appeal to enthusiastic motorists at home or in the club is the Saxon clock, made in two sizes, the clock mechanism being fitted into the regular pattern of lamp case, with front lens covering the face and hands. The new 1908 model is shown with a French movement with white face and large brass figures, making a very handsome mantel clock for a club.

The Presto-Lite Co. has a complete exhibit of its specially constructed tanks charged with acetylene gas. The Sterling lamps and generators and the Gray & Davis lamps and generators are shown by the Auto Accessories Mfg. Co.

The Cold Blast lamps of the C. T. Ham Mfg. Co. have been improved by a new rolled rim and in other minor details; the Rochester model is a new square lamp with oil reservoir of 27 hours' capacity. The Apex model is a new lamp for runabouts. The Acme model is fitted with a new combination lens. The Post & Lester Co. shows its regular line of lamps.



MOTORISTS seem to be well equipped with tools, judging from the exhibits in this line at the palace, and they seem, too, to be satisfied that those they have are about good enough, for there are very few new things shown and few improvements on old ones. The electrically-heated soldering irons attract a good deal of attention, but they have been known for some time. The huge Coes monkey-wrench, 6 feet long, of solid steel, is interesting, but obviously not for the motor car; in fact, it is for bridge work. Tool kits and tool rolls are seen in plenty, but for the most part contain the regulation-designed implements. One roll, shown by the Gilbert Mfg. Co., of New Haven, Conn., includes in its equipment a hammer and screw-driver of the fool-proof, unbreakable kind. The hammer-head and handle are of a single piece of steel, the grip being made of wood cheeks riveted on; the screw-driver is made on the same principle, and both are neat and substantial looking tools. In the same kit is a plier that is practically two pliers on one. By opening the jaws to their full capacity and then pulling them apart the pivot stud snaps into another bearing, passing through a slot in the jaws, and the jaw-opening is increased about 50 per cent. The tool is called the Axiom plier.

A brand new light-weight jack is shown by the Elite Mfg. Co., of Ashland, O. This jack is of the screw-and-nut variety; the nut takes the form of a bevel gear and meshes with another bevel gear journaled to the stock of the jack and operated by a pawl in a vertically-swinging handle; the pawl works both ways, for raising and for lowering the screw, being merely pushed into one position or the other with the finger. In mid-position the pawl is free and the bevel gear can be turned by a little hand crank, giving a quick motion for getting up to or away from the work. The screw-and-nut arrangement makes the jack hold at any point without danger of running down. The jack is called the Reliable. The same concern shows a new compound tire pump under the same name—in which there are two cylinders, one large and the other small. The air is first compressed in the large cylinder, whence it passes, through the hollow piston rods of inverted U form, into the small or high-pressure cylinder, where the compression is completed and the air delivered through the usual hose at the foot.

Patterson, Gottfried & Hunter, of 150 Centre street, New York, show a large assortment of tools suitable for motor work, both in the garage and on the road, among them being the Perfect Handle hammers and screw-drivers already described in connection with the Gilbert exhibit. These tools are manufactured by the Patterson, Gottfried & Hunter Co. Here are also shown sets of screw-plates and taps arranged in sizes especially suited for motor work and packed in polished wood cases with separate spaces for each part.



DISPLAY OF SOLAR LAMPS

Steam and Electric Cars Motor Cycles

THE single steam car exhibit is the Lane, which continues along the lines that are familiar in this car. The boiler is placed under the rear of the bonnet and has its water tank between it and the condenser which is the front of the car. The engine is inclined and placed under the driving seat footboard with the gasoline tank under the driver's seat. The drive is direct by single chain to the center of the rear axle. The engine is a cross compound and the boiler of the coil type to give a compromise between the flash and the motor tube types.

The regular line of Reading Standard motor cycles has been added to by bringing out a two-cylinder model with the cylinders placed in V position and two designs in tricycles with the framing giving the only difference in the two. One of these is arranged for a delivery box front or a forecarriage seat while the other has a removable top frame tube for the use of women. The regular models of the single-cylinder are shown.

Of the two motor cycle exhibits that are showing the F-N four-cylinder machine is especially attractive. This Belgian product is the only motor cycle having four cylinders and a bevel gear-shaft drive. In addition to the four a new single-cylinder model with a belt drive is shown. To overcome the high peripheral speed that has always caused trouble in belt-driven machines a geared pulley is mounted on the engine. It consists of a spur fifteen-tooth pinion mounted on the engine shaft and driving a V-shaped belt pulley with fifty-two internal teeth. By this means the ratio of the belt-driver is reduced three and one-half times and the driven pulley is reduced in diameter, giving not so sharp a turn of the belt in running over the driving pulley, an initial fault in belt driving. To regulate the tension of the belt the internally-toothed pulley turns on an axle mounted eccentrically on a plate attached to the crankcase. This plate is operated by an endless screw on the lower end of a rod attached to the side of the tank.

The Lansden company has added to its line, which has heretofore been electric wagons, a new car in the form of an electric pleasure rig known as the 100 miles car. The body design is a conventional touring body, the makers of the car accepting this as the standard in lines. The car is the result of the often reported efforts to produce a long distance electric with Edison battery, experience showing that tires and spring suspension were large factors, the body spring suspension is in the form of nested helical springs, there being four of these nests at each corner of the chassis. The 100 miles per battery charge is at the rate of 20 miles per hour, but a maximum speed of 30 miles is provided for. The car weighs complete 3,400 pounds.

The Anderson Carriage Co. show two cars of conventional construction in electrics. They are demi-broughams with battery compartments front and rear on the body platform.

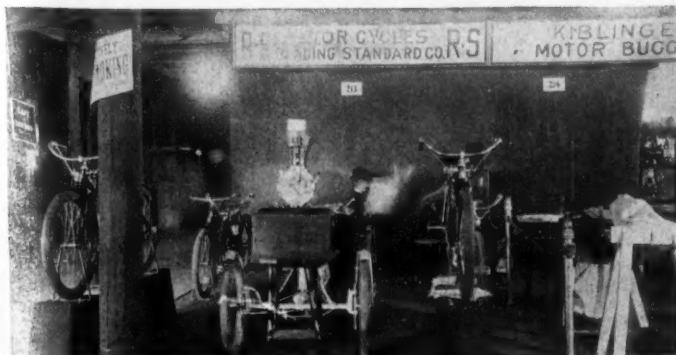


EXHIBIT OF READING STANDARD MOTOR CYCLES

Radiators

WHILE nothing very startling has been developed this year in the radiator line, there have been brought out some ingenious methods of construction which would seem to make a more durable and less costly radiator than those heretofore used. It may be said, however, that the tendency is to use the flat vertical tube type of radiator on the lighter and medium-powered pleasure cars and the cellular and honeycomb types on the larger and higher powered machines. On pleasure cars the round tube radiator of both the vertical and horizontal type seems to be losing ground, although on trucks and delivery wagons it appears to be holding its own if not actually gaining in popularity. This is probably owing to the fact that while it is not so light for a given cooling surface as the others, it is much more durable, being able to stand abuse and can be readily made in sections so that in case of a leak or other damage a section can be removed and another substituted with comparative ease.

As regards the general shape of radiators which is affected by the motor hood section or vice versa, there is little uniformity in practice except that the sides are generally vertical. The tops are of all styles, from dead flat to rounded. Some shapes show diagonal sides and flat top. There are a few radiators of round section but these are in the minority.

In the flat vertical tube radiator construction, the practice seems to be divided between the use of a tube with its width equal to the entire depth of the radiator or of several smaller tubes of a fraction of that width. Regarding the use of cooling fins on this type there seems to be no settled practice, although in all cases horizontal plates are used which in a measure act as fins in the radiator.

In cellular radiators the diagonal square type of the Briscoe Mfg. Co. is worthy of notice. In this a round tube of large diameter is worked into the elongated shape shown in figure 1. The ends are slightly expanded, thus giving a water space at the center of the section. These tubes are assembled in staggered horizontal rows, as seen in figure 2, one row being represented by a, b, c, and the other by d, e, f. It will be seen that by this arrangement a vertical flow is afforded from top to bottom between all vertical rows of squares and a nearly horizontal flow at every three squares. For appearance sake this radiator has been made with the rows of tubes running diagonally instead of horizontally, thus giving the appearance of the ordinary square tube cellular radiator.

A type of square tube radiator which seems to have come into some prominence this year is one in which the tubes are not retained in vertical rows but are staggered, as in figure 3. One or two cars employ radiators of the cellular type made up of individual hexagonal tubes with enlarged ends, but they are in the minority. Perhaps one of the best arrangements in a sectional radiator is that employed on the Reo cars. This is of the flat, horizontal tube type, the ends of the tubes being let into a cast manifold. The manifolds are secured at their corners by bolts and are jointed at their centers by a ground joint fitted with a gasket at either side alternately so the water flows from side to side in finding its way from the bottom to the top of the radiator. In case of damage to one section, that section can be removed from the body of the radiator by the use of a wrench.

To recapitulate, while nothing of a startling nature has been developed in the radiator line, yet much has been done in the simplification of manufacture tending to make a more durable article at less cost, and at the same time much more thought seems to have been given to the particular requirements in certain cases so as to produce an article giving the most satisfaction considered from all points.

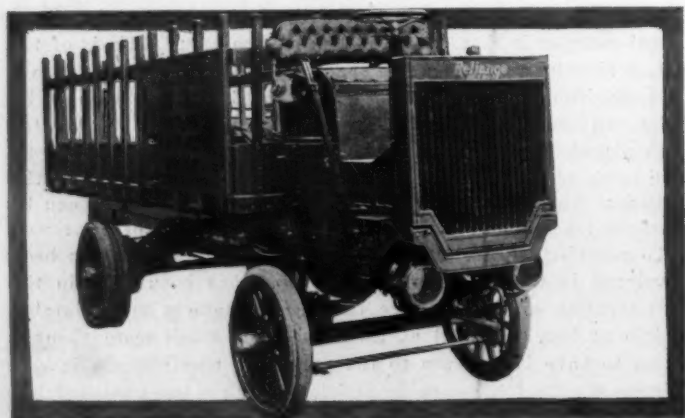


NO GREATER departure in the commercial car field is witnessed in the show than that exemplified in the new 3-ton Logan, in which the company has installed for the first time a four-cylinder water-cooled motor with valves in an integral chamber on one side, opened by a single camshaft enclosed within the motor crankcase. This motor is located longitudinally in front and carries with it every modern feature of motor construction. Notable in it is the use of cylinders cast in pairs with integral waterjackets, high-tension ignition with current taken from storage cells and crankcase-contained lubrication, in that the crankcase is cast with a basement portion which serves as an oil reservoir and from which the oil is drawn by a gear pump and delivered to the top part of the crankcase and to the important motor bearings and parts. On the front end of the basement portion is a bull's eye for showing the oil level. Cooling is through a large-sized radiator, with a gear-driven pump and fan. Flexible connection with the transmission assumes the form of a multiple disk clutch of twenty-nine disks, fourteen and fifteen in the alternate sets, both of steel and operating in oil. Back of the clutch comes the three-speed selective gearset, in which the gears and shafts are chrome nickel steel parts. Both shafts are carried on Timken roller bearings with Hess-Bright ball races for end thrust use. The gearcase contains also the differential gears and it has rigid connection with the jackshaft housing to such an extent that the rear end of the gearcase is supported on this housing from brackets on the side members of the frame. In front the gearcase support is novel, consisting of a single steel rod attached at one end to the frame crosspiece and at its rear attaching to the under side of the gearcase. To provide access to the differential gears as well as the pinion bevel on the end of the main shaft of the set, the lower half of the transmission case is cast integrally with the lower part of the differential case. To the differential part of the casting are bolted flanged sleeve pieces, into which the tubes forming the jackshaft casing are brazed and pinned. The result of this construction is that the gearset complete has a three-point suspension, one forward point and two rear points on the side piece of the car frame. To facilitate the dissembling of the case the main and countershafts have their bearings located between the halves of the case. The two

sliding gears operate on the mainshaft and the shifter rods are enclosed in the right half of the gearbox between the halves, the introduction of interlockers preventing the meshing of two sets of gears at once. Connection between the gearset and clutch is by shaft with universal joints and from the jackshaft to the road wheels by side chains. The ends of the jackshaft find support on the frame through a pair of large-sized V brackets, with the tops of the arms bolted to the frame and the lower corner fitted with a split bushing for taking the shaft. Between these V brackets and the rear axle extend distance rods with turnbuckles for taking up the chain tension. Double brakes are in place, one pair on the rear wheels, the other on the ends of the jackshaft, located between the frame and the sprockets. The frame is a heavy rectangular construction of channel steel with the channel mouth turned outward instead of downwards, and in place of having separate side and end pieces but two lengths are required, which form the side and half of each end. Supporting this framework is a set of full elliptic springs in front and a platform scheme in the rear in which the cross member is located beneath an angle crosspiece, whereas the crosspiece of the frame is much further to the rear, this giving a long carrying platform. In the front axle, which is a very large steel casting but which later will be a forging, the jaw ends forming the steering knuckle are larger than anything previously shown. They have a race of Timken rollers at the top, on which the weight of the car is carried and which is claimed to make the machine steer very easily. The rear axle is a steel forging of square cross section. The rear wheels carry twin solid rubber tires. Besides this truck the Logan firm has its two air-cooled models, one a 1-ton truck and the other an 1,800-pound delivery wagon. Both have Carrico four-cylinder motors as power generators and in nearly every regard they conform to the present designs.

Rapid Has the Largest Display

By far the biggest display of commercials is the Rapid exhibit, in which such types as police patrol, opera bus, twelve-passenger sight-seeing wagon, twenty-passenger sight-seeing vehicle, twelve-passenger pullman with cross-seats, sixteen-passenger wagonette and 1½-ton truck appear. The same chassis is used in all of them, except for a few alterations, such as lengthening the wheelbase and changing the frame and springs. A glance at the stripped chassis shows it has not been changed in design but a short talk with the designer reveals many minor details that have received attention since the close of the last show circuit. The valves for the motor cylinders are made with steel stems and cast iron heads, the union of the two being by threading the stems on to the stem up to a shoulder and then riveting them. Improvement in the steering gear includes adjustable knuckle connections and the making of the sector and gear heavier. The motors, rated at 24-horsepower, are in two sizes, one with 5 by 5-inch cylinders and the other with 5¼ by 5-inch measurements, the larger size serving on the 1½-ton machine. In the other the bore and stroke are 5 inches. The chassis of these cars is typically American in that the two-cylinder opposed motor is carried amidship with the two-speed planetary gearset carried on a continuation of the crankshaft.

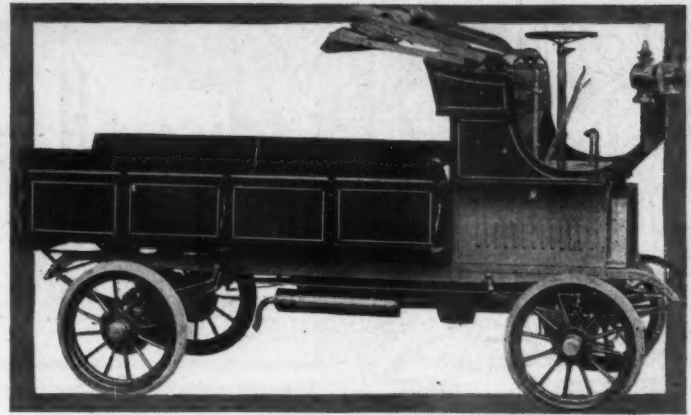


LATEST MODEL RELIANCE TRUCK

From this shaft a single chain connects with a jackshaft. Final drive to the back wheels is by side chains. The springing of these vehicles has been carefully studied out and besides using a platform support in front and rear an additional cross spring is carried over the rear axle, which aids the rear platform. The front platform has its cross spring carried to the rear of the side springs. Steering is through a gear and sector combination with a vertical column carrying a large hand wheel. Cooling calls into use a large capacity tubular radiator with current provoked by gear-driven pump, ignition is by a jump-spark system with two-unit coil on the dash and there are three brakes of the internal type. The wheelbase ranges from 86 to 90 inches. As to body styles perhaps the opera bus is the most luxurious and interiorally resembles the finished articles from the factory of a builder of pleasure cars. In it seats are arranged oppositely on the side, entrance is through the rear and every fitting and convenience is in place. The police wagon for the New York department is a likely-looking vehicle and the design of the sight-seeing wagons, the pullman and wagonette are much as at present. Altogether the Rapid people have an attractive exhibit of commercial cars which is proven by the crowd which it attracts.

Three Styles of Reliance Cars Are Shown

Reliance trucks are shown in three styles and sizes: One a 30-horsepower two-cylinder two-cycle construction, exhibited with an express body attached; another a three-cylinder 45-horsepower vehicle, the stripped chassis only being exhibited; and the third a 60-horsepower four-cylinder truck shown with a stakebody. In all of these three machines the same general design appears, the use of two, three and four cylinders being the distinguishing features, coupled with increased parts and longer wheelbase measurements. This concern, which has used the two-cycle motor for several seasons, fits it in all three, the cylinders being regularly 5 by 5 inches for bore and stroke. All parts are made interchangeable and the operation is on the three-port principle in that the mixture first enters the crankcase and then through bypass channels in the cylinder sides passes into the combustion chambers. Although the show cars are fitted with a stock-made carbureter, the company has ready its own carbureter, which will be fitted generally to cars delivered during the approaching season. The factor of safety in the three trucks is very apparent. Perhaps in the big 60-horsepower machine it is more so. The frame is 6-inch channel steel with the channel turned outwards and out of the ordinary is sloping the body from the front of the rear, which undoubtedly must assist very much in unloading as well as preventing merchandise working forwards against the seat or motor. Like in the Logan the front axle is a mammoth piece of I-beam cross section formed of a vanadium nickel steel casting. In the steering knuckles is a race of Timken bearings for carrying the load. Timken rollers are fitted in all of the road wheels. The motor connects with the sliding gear transmission through a cone clutch and short propeller shaft, the latter introduced to allow of the gearset being carried well



A RACINE PRODUCTION—MITCHELL

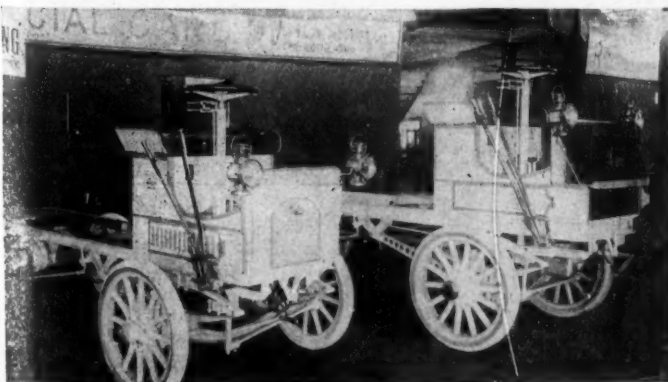
back, as it contains in its rear end the differential gear carried on the jackshaft. Final drive is by side chains. The transmission uses low carbon steel gears, has its shafts carried on ball bearings and now oil tubes from the motor lubricator oil these. On the two-cylinder machine are 32-inch road wheels and on the three and four-cylinder types are 36-inch wheels, with twin solid rubber tires in the rear. Braking is through external bands acting on drums on the rear wheels and jackshaft, both sets with camels hair friction surfaces. Long-Turney tubular radiators are in place. Like most of the others, this booth attracts men interested in the commercial proposition.

Trucks as Built by Mack Brothers

Manhattan commercial cars, manufactured by Mack Brothers, are shown in two styles, a passenger vehicle with cross seats and canopy top suitable for sight-seeing work and a 5-ton truck with stake sides and canopy top. The company specializes on order work but in all uses practically an identical chassis. Following their policy of several seasons the four-cylinder motor is continued in which the cylinders are cast in pairs with mechanical intake and exhaust valves on the right side operated by direct lift. A double system of ignition is employed, one system being high-tension magneto, the other a battery with unit coil and timer. A double set of plugs may be used. Speed changes are through a three-speed set, operating on the individual clutch principle, with control through a selective lever. Final drive is by side chain. The frames are channel steel construction, which at the front are rounded so the curved portion forms a buffer for the radiator. Springs in front are semi-elliptics and a platform suspension is used in the rear. Axles are hammer forged steel pieces with taper roller bearings.

Only One Electric Commercial Rig

The Lansden electric enclosed delivery wagon, the only electric commercial machine at the show, has an underslung battery, side chain drive and a most attractive body, in which the panels are in gold and the frame part in white.



LOGAN COMMERCIAL EXHIBIT



AS THE RAPID CARS WERE STAGED



Miscellaneous Parts, Tools and Motor Necessities

KEEPING pace with the development of the motor car, the makers of garage equipment and appliances have so promptly and so completely met the demands of those whose business it is to care for cars when not in use that it would almost seem as if the last word had been said on the subject. So many labor-saving devices are already in use that it is really difficult to think of things which might be invented, but are still to come. Naturally, the number of out-and-out novelties decreases from year to year, and this is quite strikingly exemplified in the present show. Nevertheless, well-known appliances are seen but few of them are new ones.

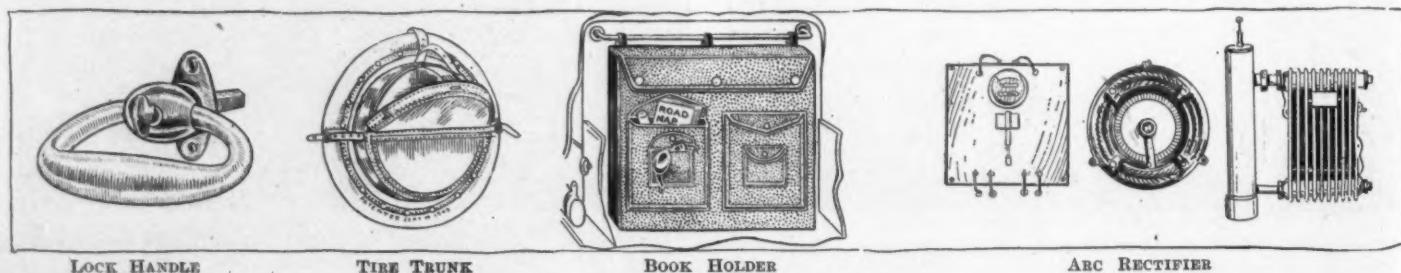
The Hickley electrolytic rectifier, a device for converting an alternating current of electricity, which cannot be used for charging storage batteries, to a direct or continuous current, which can, is shown by the Electrical and Mechanical Development Co., of Asbury Park, N. J., and is very commonly believed to be an electric heater on account of the radiator, exactly like the familiar steam affair, that is part of the apparatus. Briefly, the rectifier consists of a set of electrical measuring instruments, a resistance for controlling the strength of the alternating current and the necessary switches and connections, all mounted on a slate panel carried by a frame of angle iron, and the radiator-like reservoir which contains a chemical compound whose ingredients are a trade secret. The current is led through the instruments and resistance on the switchboard to the electrolyte in the reservoir; and in passing through this liquid the pulsating alternations of the current are changed to a continuous flow or direct current, which is then available for battery charging. The heat generated in the electrolyte by the passage of the current is dissipated by the great area of the radiator exposed to the air. An efficiency of 85 per cent is said to be obtained with this apparatus—that is, only 15 per cent of electrical energy is lost in making the transformation. The cost of up-keep is limited to the slight expense involved in recharging the reservoir with electrolyte about once a year. Different sizes are made for sparking batteries.

A recent addition to the list of conveniences for handling oils in garages is the portable lubricating oil tank exhibited by S. F. Bowser & Co., of Fort Wayne, Ind. In some respects this is similar to the portable wheeled gasoline tank made by this concern, having a tank mounted on rubber tired wheels. It is especially adapted for use with lubricating oils, however, by having the tank divided into several compartments—from two to four—and a pump, of the automatic self-measuring type, drawing oil from each compartment—as many pumps as there are compartments. The idea is, of course, to carry a different

kind or grade of oil in each tank. Details are the use of small wheels or castors in front to permit the tank to stand, and the addition of a brake which locks the main wheels and prevents movement when not desired. The Bowser exhibit also contains a steel oil cabinet, with steel roll-top like a roll-top desk—a fireproof arrangement.

A very neat and mechanical-looking power inflating pump, called the Delpench, is shown by the Comptoir d'Innovations Pour Automobiles, of Paris, and 1693 Broadway, New York. This consists of a steel cylinder, horizontally mounted on four stout feet, and carrying at its forward end adjustable bearings for the one-piece crankshaft. A steel connecting rod and piston, the latter having steel packing rings and an air valve in its head, and valve and hose connection for the air outlet in the cylinder head, complete the pump proper, the whole in appearance being much like a little horizontal gas engine without flywheels. On the crankshaft, outside the bearing, is mounted a steel spur gear which rotates with the shaft, but can be slid lengthwise on a spline or feather. A second gear is mounted immovably on the shaft from which the pump is to be driven, and the pump set up so that the two gears mesh properly, but can be freed from each other by sliding the pump gear on its shaft, a collar, ring and lever for the purpose being supplied. This pump can be mounted either in the garage, as a stationary inflator, or on some part of the car, to be driven from the engine. The same concern exhibited a pneumatic jack, to be operated by air pressure either from the power pump or from an ordinary hand tire pump.

When a garage man gets ready to do a job of valve grinding he usually mixes up some emery or other abrasive with oil until he guesses it's about right, and then proceeds to grind. A better way has been worked out by the Clover Mfg. Co., of 228 West Fifty-eighth street, New York. This concern exhibits the Clover grinding compound, which is a mixture of an abrasive, which the makers state contains no emery, and a heavy grease of a kind particularly adapted for grinding. The proportions and the consistency are scientifically correct, and as the abrasive is held by the grease it cannot well get into the cylinder when valves are being ground, unless too much is put on. The grease will not dry out or run off as oil will do in grinding. The compound is said to be very useful for grinding in pistons and rings and for bringing bearings down to a final working surface, avoiding much of the tedious hand scraping necessary in finishing bearings properly in the ordinary way. Clover compound is put up in double cans, containing two grades, coarse and fine, for all kinds of grinding.

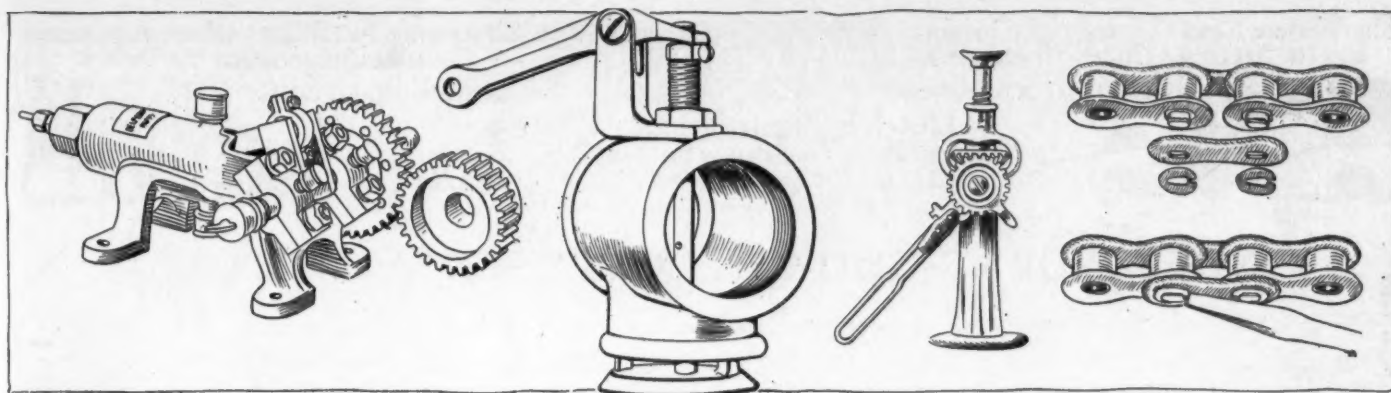


LOCK HANDLE

TIRE TRUNK

BOOK HOLDER

ARC RECTIFIER



DELPENCH TIRE PUMP

GRAY CUT-OUT

RELIABLE JACK

NEW BALDWIN CHAIN

The B-T or Brownell-Trebert motors for both motor cars and launches are now built by the F. A. Brownell Co., of Rochester, and a new type, called by the maker the plain top, is shown for 1908. The camshaft has been removed from the top of the cylinders to the crankcase, the valves being operated by rockshafts on the top. The cylinders are cast in pairs and assembled in groups of either four or six. There are shown 30-35 four-cylinder and the 45-50 six-cylinder, each $4\frac{1}{2}$ by 5 inches; also the 55-60 four-cylinder, and the 75 six-cylinder, each $5\frac{1}{2}$ by $6\frac{1}{2}$ inches. The motors show good design and are very clean and compact in appearance. A special feature is a small but powerful water pump of bronze, made by the company to meet its own wants in these engines.

The new 1908 Herreshoff motor, manufactured by the American & British Mfg. Co., of Bridgeport, designed by Charles F. Herreshoff II, is identical in design and construction with the engine of the launch Den II, which recently showed such speed on the Hudson river. While the Den engine with larger cylinders gave 80 horsepower, this with four cylinders 5 by $4\frac{3}{4}$ inches is rated at 40 horsepower. One engine is shown with one cylinder, valve chambers sectioned and run by electricity to demonstrate its operation; another is shown on a platform scale, balancing at 415 pounds for engine, carbureter, and exhaust, inlet and water pipes ready for line connections. The base is a single casting of aluminum, in which the oil is maintained at a constant level by a gear-driven pump. The flywheel is coned internally for motor car work. The character of the work, both in design and construction, is well exemplified by the exhaust manifold, which is tapered in form to take the discharge from each successive cylinder in greater volume, flanged on the outside, and cast in a special gray iron which gives a perfectly smooth external finish. The same engine is built with six cylinders, giving 60 horsepower, all sizes being fitted either for car or launch work as ordered.

The Thor motor is shown in a new six-cylinder model, known as Thor VI, with cylinders approximately $4\frac{3}{4}$ by $4\frac{3}{4}$ inches, giving 60 horsepower at 1,500 revolutions, but running up to 2,000. The weight of the motor is 728 pounds, with a flywheel of 93 pounds figured in the reckoning.

The Shaler electric vulcanizer is shown in several styles, notably the new type D, portable, smaller and of lower price for the use of individual owners. An important improvement is the new valve-stem attachment, a special iron form for vulcanizing valve-stems on the inner tube.

Of interest to makers is the exhibit of the Norton Co., of

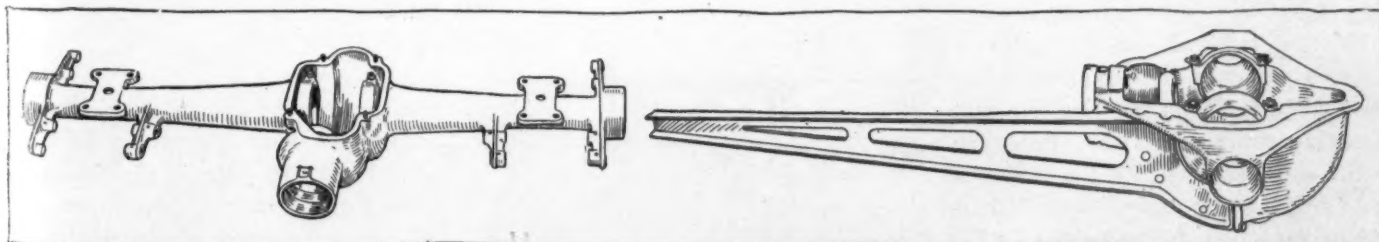
Worcester, Mass., of grinding wheels of alundum for grinding bearings and other parts. The individual owner will be interested in the Jef valve grinder, the invention of John E. Fry, and made by the Jef Mfg. Co., of Denver, Col. This is a convenient little device somewhat similar in form to the old family egg-beater by which a valve may be quickly ground into its seat.

The Nathan Novelty Mfg. Co. has added to its large line of covers and cases a convenient bag or pocket to hang from the coat rail. These are of various sizes, from 24 to 36 inches wide, with a number of small and large compartments for caps, veils, dusters, road maps, goggles, etc. One form of the Nathan tire trunk is made to fit inside the spare tire, making a handy receptacle for inner tubes and other small articles. The Hayes Mfg. Co. is showing tool boxes and battery boxes in many sizes and styles, of enameled metal with pressed steel covers, hinges, hasps, locks and handles.

New in the accessories department is the Hele-Shaw multiple disk clutch, which is the father of disk clutches and an English importation. In this clutch are alternate steel and silico bronze disks, the numbers in each set ranging from a dozen up, according to the horsepower of the car. The disks are not flat-surfaced plates, as in nearly every American clutch, but have a V corrugation in the face of each disk, these corrugations increasing the friction surface of the clutch and also giving a surface that will engage more gently and disengage more positively than does the flat-surface type. The entire clutch is carried in a drum casing bolted in the rear face of the flywheel, and operates in oil. Engagement is by a single coil spring.

Close to the Hele-Shaw is the booth of the Standard Brake Co., with cork inserts for cone clutches, brake drums, pulleys and other surfaces. The corks, varying in diameter from $\frac{3}{4}$ -inch upwards, are inserted in depressions in the clutch metal face, so the cork rises slightly above the metal surface, with the result that the cork engages first and softens the start until engagement pressure pushes the cork into its depression and the metal surfaces meet face to face.

Two examples of universal joint are seen in the gallery construction. The Spicer has a forced cross centerpiece and a cylindrical bearing in the ends of the forks for the cross, each bearing having a bronze bushing. In the Hartford joint the center is a circular metal disk with four sockets, into which the ball ends of the forks fit, the center disk being marked in four parts in order to insert the ball ends of the forks and secure them rigidly in place.



CRAMP'S ONE-PIECE REAR AXLE HOUSING

GARFORD SHEET STEEL TORSION LEVER

The Western News Company of Chicago
and Its Branches Supply Newsdealers

NH Van Sicklen, Manager



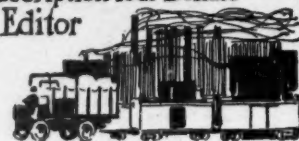
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Charles P. Root, Editor



INDEPENDENT SHOW A REPRESENTATIVE ONE



STUDENTS of motor car construction and prospective purchasers of motor cars find in the exhibition now in progress in Grand Central palace, New York, such a variety of subjects in the exhibits as to bewilder them;

and they find, also, such strides in refinement of manufacture and taste in design, and such general improvement in all directions, as to cause them to believe more than ever that America has reached the top of the mountain in the motor car world.

The show in progress in the palace is cosmopolitan in the extreme, and because of this it naturally serves as a splendid school for one who is in earnest over a desire to see what improvements have been made and wherein clever ideas have been incorporated in the goods that are to be marketed for 1908.

Quite naturally the number of innovations decreases each year and in their places come taste, quality and general refinement. The day of radical changes has passed. The undoubted feature of the show is the big display of six-cylinder cars, not fewer than eighteen makers being before the public asking for favor in the matter of this type of construction. Next in importance is the other extreme, the buggy type of motor car, one which must eventually cut an important figure in the industry because of the fact that this type naturally appeals to the rural resident, not only because of the price but because conditions are such as to demand an entirely different type of car from that which finds its users living in cities and where good roads abound. The ruralite of necessity must have something of a different order.

Price should never again be a stumbling block to the man who really desires to own some sort of a road vehicle that propels itself—there are cars now on the market from a few hundred dollars in price to those ranging well up in thousands—and it must be remembered that those that are priced at only a few hundred dollars are today far superior to those of only a few years ago. There are big cars and little cars, high-powered cars and low-powered cars; there are some with one cylinder and others with six cylinders; there are cars with all sorts of speed change schemes and all sorts of valves and other common-place things, so that almost any mind can be satisfied.

Friction transmission is about in the same position it was a year ago, its exponents being the Lambert, Cartercar, Gearless and Hatfield concerns. The two-cycle motor is represented by the Reliance and Atlas, and the Frayer-Miller, Logan, Holsman, Marmon and Carter represent the air-cooled principle,

which, while it has not lost ground, has not gained. The fact that some of the builders of air-cooled cars exclusively have also gone into the manufacture of water-cooled cars would seem to indicate that in another year the number may be reduced somewhat.

Commercial cars are not so heavily represented at this show as at previous affairs, but the fact is the makers of commercial cars have seen so much prosperity many of them have felt it is a waste of time and money to exhibit their wares when they are being taxed to fill orders already in hand. Those commercial cars that are on exhibition show decided improvement in the matter of the strengthening of vital parts, in better bearings, in the use of magnetos and in the introduction of twin rear wheels, because of the tendency to overload these affairs in order to make them as paying propositions as the purchasers can scheme to do so.

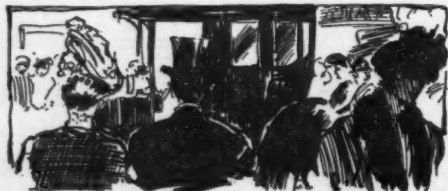
Some of the familiar faces are gone, having passed out of existence because of poor management, through the money flurry or because of some other reason, but while a few are absent there are others to take their places, although the number is but a dozen and some of these are only on record as never having been exhibitors in New York before. In all probability the number of makers having gone out of existence is not so great as the number that sprung up in the past year, so the field is by no means diminished in number.

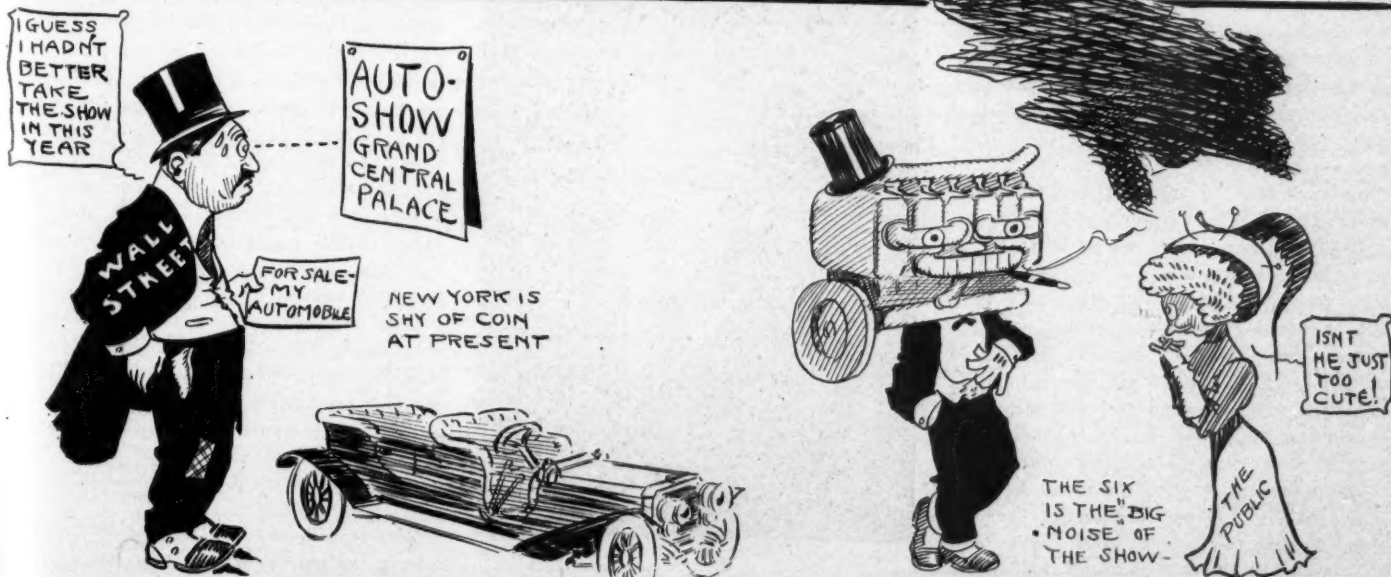
Demand must have been responsible for the bringing out of so many roadsters as have made their appearance within the past year. The maker of motor cars who has not included this model in his list is the decided exception, and it only goes to prove what Motor Age predicted a couple of years ago, that the tourist would find more comfort in this type rather than in that designed to carry from five to seven people. Closed cars are finding more favor as the years go on, because gradually people have come to learn of the convenience, the quickness and the cleanliness of the closed vehicle.

Modern cars are fitted more sumptuously than they have ever been, they are better in design, in material, in reliability; they are more quiet, more powerful and better.

The early season exhibitor of the Automobile Club of America—which as all know is the show of the inde-

pendents—is a representative show and it is a good show. If the attendance is not what might have been expected from so great a show town as New York it may be laid to the fact that the inhabitants of the metropolis are too deeply interested in stocks.





JUST A FEW OF THE SHOW IDEAS THAT CAME TO THE MIND OF THE CARTOONIST

AIMS AND PURPOSES OF THE INDEPENDENTS



BENJAMIN BRISCOE

What the American Motor Car Manufacturers' Association Has Done, What It Is Doing and What It Has Planned To Do in the Future, as Told by Alfred Reeves, General Manager



ALFRED REEVES

STUDENTS of motor car building as well as intending purchasers, have watched with interest the phenomenal growth of the American Motor Car Manufacturers' Association, the big organization sometimes called the independents, which from the fifteen members of 3 years ago is now at the front of all similar trade associations with a membership of fifty-one of America's leading motor car manufacturers. Interest in the work of the association is particularly keen at this time owing to its participation with the Automobile Club of America in the eighth annual show in the Grand Central palace, at which show the members occupy almost all of the main floor space. As far as can be ascertained from reports received at this time, it is estimated that the members of the A. M. C. M. A. will in 1908 make about 37,000 cars, or more than 60 per cent of America's motor car production, with a selling valuation of something over \$55,000,000. The spirit of the association is to further the interest of the sport of motoring; increase the use of motor cars for commercial, professional and pleasure purposes and assist the common interests of its customers as well as its members. The makers holding membership conduct their business independently of each other and are not restricted as to the volume of their business; the price at which they sell their cars, or in any other way.

The one great aim of the A. M. C. M. A. is to bring about benefits and offer guidance to its members that they may turn out the best cars at the lowest possible cost with the ultimate object of being able to supply these cars to the general public at prices within reason and yet permit of a fair margin of profit. In the manufacture of motor cars, safety and comfort are the first essentials, with the price the next consideration. When all this can be combined so that the maximum of quality can be given for the minimum of price, the

trading is certain to be satisfactory to both the buyer and the seller.

The aims and purposes of the American Motor Car Manufacturers' Association are to arrange for suitable exhibitions of its members' products; to conduct race meets; to increase the interest in the purchase and use of motor cars; to secure desirable rates of transportation and shipment for machines made by its members, and for people who buy them; to furnish agents full information regarding trade in motor cars, the new forms of construction, the merit of the car itself and the developments in general; to promote public interest in good roads in every way possible and to oppose inimical legislation. Also to further the exchange of scientific information by the constructing engineers of the various companies with a view of improving the manufacture and standardization of motor cars of American make.



J. B. BARTHOLOMEW

Not the least important work undertaken by the association this year was that of securing the use of docks for gasoline vehicles. A member of its freight and transportation committee appeared before about seventy of the freight agents and subsequently secured the endorsement of the insurance companies and a record of their work, so that gasoline vehicles now are allowed on more than half the docks of New York, with the others fast coming into line. This has been of tremendous benefit to those who manufacture commercial vehicles, and who up to this time have been handicapped in selling to business concerns that use the docks.

The foreign representative, A. E. Schwartz, has this year been of decided benefit to the members, bringing over in July much valuable information regarding foreign trade, besides closing the agencies for a number of important lines including axles and bearings. The compilation of a list of motor car agents and dealers has been another good bit of work by the A. M. C. M. A. Another important matter which has received attention is a uniform guaranty that is liberal to the buyer and fair to the maker. Advertising advice and plans; work for a national law providing for a single license number good in every state, and of course the perennial question of good roads, have all supplied work for committees well versed in those subjects. Much hostile legislation has been opposed this year, including some proposed bills which if passed would have seriously decreased interest in motoring. One of the greatest works of the association is the publicity department under the management of Leon Myron Bradley. The matter of liability insurance, freight rates, larger and more freight cars, and similar work, has been the subject of much work on the part of the association.

Importations have fallen away so much during the past year that this did not take

up as much time as usual, but it has been given the thought it deserved, and members have been informed of the cars brought from the other side.

On its committee of management and included in its membership are some of the very best men in the trade. The chairman of the committee of management for 2 years was James Couzens, of the Ford company. The present committee of management consists of Benjamin Briscoe, chairman; R. E. Olds, vice-chairman; H. O. Smith, treasurer; William Mitchell Lewis, secretary; Charles Lewis, W. H. VanDervoort, Charles E. Duryea, W. C. Marmon, Barney Everitt and Alfred Reeves, general manager.

RAMBLER AND BERLIET SHOWS

New York, Oct. 25—Two big concerns, the Rambler and Berliet, are not in the show but have outside exhibits. The Rambler line is at the concern's sale rooms, where Thomas B. Jeffery & Co. have an exhibition of their own. Although the Rambler people will continue for 1908 their two-cylinder motor with unit power and transmitting plant, they have ready an entirely new offering in the four-cylinder field by way of a motor different from anything previously brought out by them, and with a chassis containing a selective gearset, shaft-drive, large-diameter wheels, double rear wheel brakes and semi-elliptic springs in front and rear. The motor, with four separately cast cylinders, with valves in the floors of chambers on the right, introduces a new single-casting crankcase with end openings through which the crankshaft is positioned. On the right side is a full-length inspection plate secured by screws. Half-time and other gears are encased in an oil-tight compartment placed some inches in advance of the forward end of the crankcase, there being room between this housing and the front of the crankcase for a transverse tube by which the forward end of the motor is supported. Although intake and exhaust valves are on the right side, the carburetor is located on the left and feeds through an intake manifold that has two pieces leading to the right side over



H. O. SMITH

the cylinder heads between the first and second and third and fourth cylinders. These pipes connect with a U which conducts the mixture to the cylinders.

The American Locomotive Automobile Co., maker of the Berliet car, not being a member of the American Motor Car Manufacturers' Association or the Association of Licensed Automobile Manufacturers, has taken an intermediate course in the show proposition by not patronizing either show, conducting a display of its own at the Waldorf-Astoria hotel instead. A room well suited for the purpose contains models of the new six-cylinder car, the 40-horsepower four-cylinder chain-driven machine and the third and new model, a 22-horsepower shaft-driven machine, it being the first Berliet car made in America to have final drive by shaft. The six-cylinder car, with its rated power of 60 horse has a motor with castings similar to those used on the fours. The car makes use of a multiple disk clutch and a selective gearset in which both third and fourth speeds ahead are on direct drive, accomplished by using two bevels on the rear end of the driveshaft of the transmission and a two-face bevel on the differen-

tial. Motor lubrication is produced by a basement crankcase system, with a 2-gallon supply housed in a lower or basement compartment of the crankcase. The cylinders have a bore and stroke of 4½ and 5½ inches, the radiator is placed 7 inches in advance of the front axle, the bonnet measures 45 inches in length and the body extends 3 or 4 inches over the rear of the chassis frame. In the 40-horsepower four-cylinder car the most notable changes are: Radiator moved to the rear of the front axle; substitution of a cast iron fly-wheel for one with fan blades; a belt-driven fan placed behind the radiator; the oil tank, instead of being hung to the left side of the car and cutting in the running board, is carried at the left side of the crankcase under the webbing connecting the case with the frame, the filler projecting up through the webbing and instead of forcing the oil from this tank to a float chamber in the lubricator it is forced through a sight feed on the dash by means of a gear pump and from the sight feed it goes by gravity to the ends of the crankcase; the steering gear attaches to the crankcase supporting arm instead of to the car frame; the spark and throttle control connections with the base of the steering column are placed now entirely above the crankcase webbing; the new arrangement of the side levers places the emergency brake lever outside of the change speed lever. In the new 22-horsepower shaft-driven car the motor lines characteristic of Berliet construction remain but owing to the fitting of shaft-drive the gearset has undergone several changes and is housed in a new design of case. The set operates on the selective principle and embodies direct drive on the high speed. The rear axle is a floating construction with the driveshafts carried on ball races and transmitting to the wheel hubs through end jaw clutches. By making the differential housing in one piece with a removable cover, the entire differential may be removed through the cover opening and all the axle-driving mechanisms removed without even jacking up the wheels of the motor car.

MEMBERS OF AMERICAN MOTOR CAR MANUFACTURERS' ASSOCIATION

Abendroth & Root Mfg. Co.....Newburgh, N. Y....Frontenac
Acme Motor Car Co.....Reading, Pa.....Acme
American Machine Mfg. Co.....Detroit, Mich.....Commerce
American Motor Car Co.....Indianapolis, Ind.....American
Austin Automobile Co.....Grand Rapids, Mich.....Austin
Atlas Motor Car Co.....Springfield, Mass.....Atlas
Bartholomew Co.....Peoria, Ill.....Gilde
B. L. M. Motor Car Co.....Brooklyn, N. Y.....B. L. M.
Brush Runabout Co.....Detroit, Mich.....Brush
Buckeye Mfg. Co.....Anderson, Ind.....Lambert
Chadwick Engineering Works.....Philadelphia, Pa.....Chadwick
Continental Auto Mfg. Co.....New Haven, Conn.....Continental
Crawford Automobile Co.....Hagerstown, Md.....Crawford
Dayton Motor Car Co.....Dayton, O.....Stoddard-Dayton
DeLuxe Motor Car Co.....Detroit, Mich.....DeLuxe
Dolson Automobile Co.....Charlotte, Mich.....Dolson
Dragon Automobile Co.....Philadelphia, Pa.....Dragon
Dorris Motor Car Co.....St. Louis, Mo.....Dorris
Evansville Automobile Co.....Evansville, Ind.....Simplicity
Ford Motor Company.....Detroit, Mich.....Ford
Gaeth Automobile Works.....Cleveland, O.....Gaeth
Gearless Transmission Co.....Rochester, N. Y.....Gearless
Imperial Motor Car Co.....Williamsport, Pa.....Imperial
Jackson Automobile Co.....Jackson, Mich.....Jackson

Kingston Motor Car Co.....Kingston, N. Y.....A-K
Mack Bros. Motor Car Co.....Allentown, Pa.....Manhattan
Marion Motor Car Co.....Indianapolis, Ind.....Marion
Maxwell-Briscoe Motor Co.....Tarrytown, N. Y.....Maxwell
Mitchell Motor Car Co.....Racine, Wis.....Mitchell
Moline Automobile Co.....East Moline, Ill.....Moline
Moon Motor Car Co.....St. Louis, Mo.....Moon
Mora Motor Car Co.....Rochester, N. Y.....Mora
Motorcar Co.....Detroit, Mich.....Cartercar
National Motor Vehicle Co.....Indianapolis, Ind.....National
Nordyke & Marmon Co.....Indianapolis, Ind.....Marmon
Overland Auto Co.....Indianapolis, Ind.....Overland
Pennsylvania Auto-Motor Co.....Bryn Mawr, Pa.....Pennsylvania
Pierce Engine Co.....Racine, Wis.....Pierce-Racine
Premier Motor Mfg. Co.....Indianapolis, Ind.....Premier
Pullman Motor Car Co.....Chicago, Ill.....Pullman
Rapid Motor Vehicle Co.....Pontiac, Mich.....Rapid
Reliance Motor Car Co.....Detroit, Mich.....Reliance
Reo Motor Car Co.....Lansing, Mich.....Reo
Simplex Motor Car Co.....Mishawaka, Ind.....Am. Simplex
St. Louis Car Co.....St. Louis, Mo.....American Mors
Wayne Automobile Co.....Detroit, Mich.....Wayne
Welch Motor Car Co.....Pontiac, Mich.....Welch
York Motor Car Co.....York, Pa.....York-Pullman

PLANNING CHICAGO SHOW RELIABILITY



ROAD CONDITIONS EAST OF ELGIN



THROUGH WOODS ON WAY TO ROCKFORD

CHICAGO, Oct. 26—The 600-mile 3 days' Chicago show reliability run of the Chicago Motor Club starts just 1 month from today and even at this distance the event looms up as possibly the greatest event of its kind ever pulled off in this country—on the Glidden order, but of a more strenuous nature in the way of penalties, while the advertising possibilities are gilt-edged, the affair coming as it does as a curtain-raiser to the N. A. A. M. show. The roads selected are the very best to be found in this section of the country and the turning points are each located in territory that is alive with prospects—rich farmers, most of them, who have become attracted by motor cars and who will not lose the opportunity of watching the road performances of the contestants. With the dates set for Tuesday, Wednesday and Thursday preceding

the opening of the show on Saturday, it means that the newspapers will play the event up more than they would if it came at any other time of the year. And the makers know that printer's ink at show time is of a golden hue—not black.

Considerable progress has been made since the rules and entry blanks came out a week ago. Prizes have been secured and already three entries have come in. Many more are promised but have not materialized as yet owing to the fact that a reliability run of this sort is a serious proposition which in most cases has to go to the factory for an O. K. The people at the factories are just now mixed up in the show game and consequently have not much time to consider an event a month away. After they get their second wind the makers undoubtedly will take up the Chicago matter. In fact, so sure is the

contest committee of this that it considers the dozen or so tentative entries made as good as if the blanks already were made out. R. W. Cook, representative of the Royal Tourist in Chicago, was the first man to fill out a blank and so he has been given No. 1. He nominates a 1908 45-horsepower Royal Tourist with 5½-inch bore and 5½-inch stroke, fitted with 36 by 4½-inch Diamond tires. Mr. Cook himself will drive. Henry Paulman has named a Pierce-Arrow and Thomas B. Jeffery & Co. a Rambler.

In the way of prizes J. V. Lawrence has been singularly active. Samuel A. Miles, general manager of the Chicago show and of the National Association of Automobile Manufacturers, has donated a silver trophy which will be of unique design and far different from anything ever before hung up in a motor contest. The New Southern Hotel Co. also has given a silver cup, while a third one has been promised from another source. E. A. McElligott has offered a silver cup for competition among the drivers. It will go to the man who makes the best showing. In case of a tie the interested parties will have to get out on the road and run it off.

There is a lively competition for the job of piloting this contest. It is no easy task and it will keep a car going for 3 days and at least 600 miles will have to be covered. Still, there are several anxious to take up the work. N. H. Van Sicklen has volunteered to drive the Apperson Jackrabbit through the entire test, acting as pilot. The Joseph F. Gunther, through Frank H. Trego, has offered another Apperson for the same sort of work. No decision has been reached as yet.

It is going to be a strenuous task marking the three courses, yet Thomas B. Jeffery & Co., who are carrying on a vigorous signboard campaign throughout the coun-



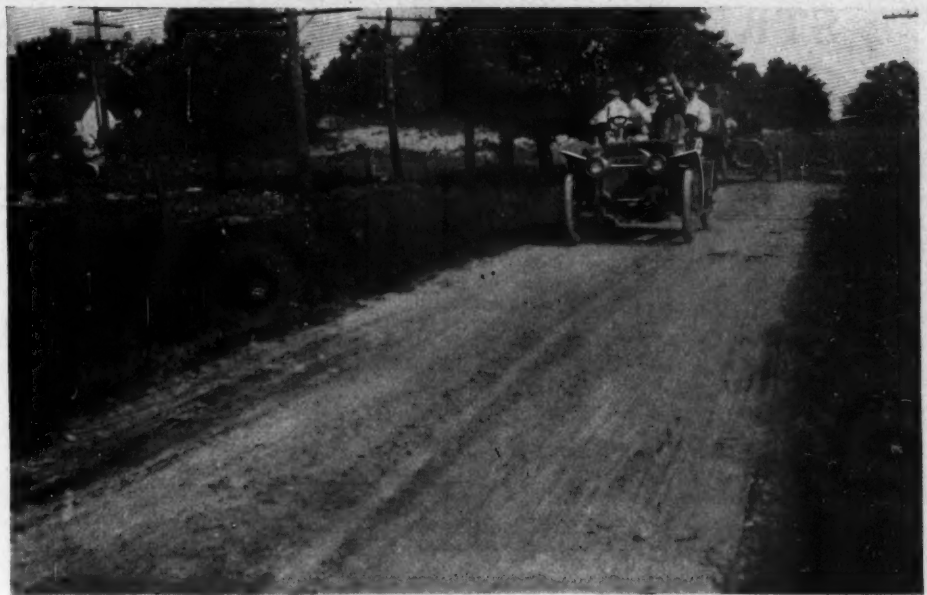
PICTURESQUE ROAD ON THE OTTAWA ROUTE

try, have volunteered for the service. They will put a force of men on the job and every turn of the three routes will be tagged with a Rambler signboard, so there will be no excuse for anyone getting lost.

The Rambler people are experts in this work and their signs already are familiar to thousands of tourists. They intend sending out a car manned by a painter, a man who knows the roads and a general overseer. This car will travel 700 or 800 miles in completing this task, yet Mr. Jeffery, who is much interested in the reliability run, has offered to put even a larger force at work if it is necessary.

Ottawa, which has been selected for the turning point of the third day's run, is much excited over the motoring honor thrust upon the town. The mayor of the city has written the Chicago Motor Club that it can have the right of way that day and that on the eventful occasion a block on the main street will be roped off which can be used exclusively by the club as a checking station. South Bend, too, is on the job and it is said the motor club will be given the key to the city.

Those who have studied the rules say that the technical committee has drafted regulations that will make a win of great value to the victorious car. Especially endorsed is the clause which says that at the completion of the test each car will be required to demonstrate to the judges that the run has not impaired its worth. This will be a test on the road—a short dash, maybe, in which the experts will judge for themselves whether or not the car is in good running order. It will have to be hitting on every cylinder, the springs, axles, wheels and body must be in good condition and also the tires must be roadworthy to escape penalization. Even if a car has gone clean to this point it



STRETCH OF INDIANA ROAD GOING TO SOUTH BEND

will be penalized if it does not prove it is in good running order.

Another point liked is that there will be no attempt made to force a driver to ruin his motor through lack of attention. While every part will be sealed and penalties exacted for breaking these seals, yet the committee is going to allow necessary parts to be oiled. Each night, upon the completion of the day's run, the bonnet seals will be broken and oiling can be attended to under the supervision of the officials. In this way no injury can come through enforced neglect, it is figured.

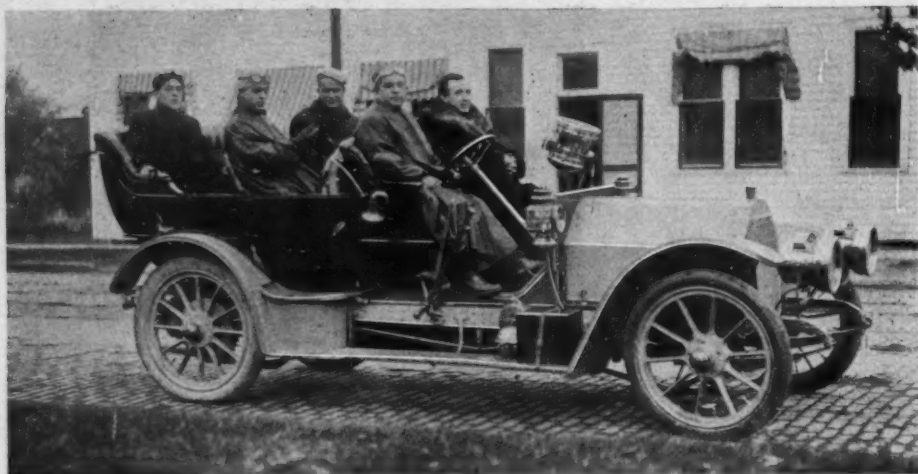
As in the Glidden the cars will be compelled to make the controls on time or suffer a penalty. On the run to South Bend, Ind., and return the first day, a distance of 230 miles, there will be a control at Michigan City, Ind. The second

day, going to Rockford, the cars will check through at Elgin, while on the third day to Ottawa the station will be at Aurora. There will be a 10-minute leeway at each point. The cars will be started each morning at an hour to be announced to the driver the evening before the start or on the morning of the start; the order of the start on the first day being as follows: Cars in class A, cars in class B and cars in class C, the order of precedent in each class being according to the order in which the entries were received. The running schedule for each day will be handed to the driver and observer the morning of the start and will approximate an average from start to finish—elapsed time—20 miles per hour for class A, 17 miles per hour for class B and 14 miles per hour for the class C contesting cars.



MAP SHOWING THREE ROUTES THAT WILL BE USED IN CHICAGO SHOW RELIABILITY RUN

STRENUOUS TEST OF A 1908 STEARNS CAR



F. B. STEARNS AND PARTY IN TEST TRIP FROM CLEVELAND TO BUFFALO AND BACK

CLEVELAND, O., Oct. 26—In the early gray dawn of a Thursday morning late in October, four men in buoyant spirits and one sleepy mechanic, protesting ever and anon against such an early start, sped eastward out of Cleveland, O., toward Buffalo on a test run of one of the 1908 Stearns cars. In good spirits, with everything pointing to a quick trip and rapid return, the car was sent eastward, Frank Stearns, head of the Stearns company, and Guy Vaughan, the racing driver, alternating at the wheel. Thirty-six hours later, as the day employes of the company were going homeward in the evening twilight, a mud-stained machine, containing five soaked, dripping and tired men, one water-logged camera, two punctured tires and one worn-out set of tire chains, pulled into the Stearns factory, the gruelling run to Buffalo and back over at last.

The run was undertaken as a try-out of one of the new 1908 Stearns cars. Almost from the start of the 400-mile run, heavy rains, the kind for which northern Ohio is famous, were encountered. Added to the so-called roads and mixed in with a few thank-ye-marms and deep ditches worn by the water, the highway resembled but a muddy river, stretching between banks of green the greater part of the way. Through this mud and muck the heavy Pullman car lunged, splashing and spattering mud and water in every direction. Yet all this discomfort was taken philosophically by all of the party, except the poor mechanic, until there came an ominous bumping, the dread of all motorists—a flat tire. Way down at the bottom of the sea of mud that industrious left front tire had sought and found a long, sharp and evil-minded nail. And so, with rain pouring down, and the almost-road ankle-deep in nice Ohio mud, the unlucky occupants of the car jacked up the wheel and inserted a new tube. Then back into the uncovered car once more, and the weary miles were again counted off.

Then the attention of the occupants of the tonneau was attracted to the little mechanic, who had picked up a huge chunk of mud, which he was industriously endeavoring to pick to pieces. "For heaven's sake, man, what did you bring that into the car for?" came the question from the inquisitive Vaughan, who let nothing escape his attention. "Mud nothin', that ain't mud—it's a wrench I dropped on the road, and I'm tryin' to find it—it's in the center of this little piece of Ohio real estate somewhere." And his answer was typical of the entire trip.

All day long the weary grind continued, with a 2-hour stop for lunch at noon. An hour or less was all that had been contemplated for dinner, but when all was ready for the start the mechanic could not be found. After a long search, he was discovered comfortably sleeping before a warm fire in a corner grocery store, steam arising from every part of his soggy clothing. Unceremoniously hauled forth into the cold, wet world, he was told to crank to wake up. Still sleepily protesting that he wasn't used to managing a houseboat, he was dumped into the tonneau, and told to prepare an essay on "Good Roads I Have Not Met."

Darkness fell early that evening, and as the lamps were being lighted, the dim red glow hovering above Buffalo became visible, beckoning on the weary travelers. With hope renewed, the journey was continued, and then, when only a few miles from the Bison City, the car pressed to the side of the road to make way for a sleepy farmer, comfortably ensconced under his covered wagon top. But the road was soft, and even as the machine headed back for the center of the highway, there came an ominous tilt, a gentle sliding motion, and, in a moment, the car rested at a dangerous angle on the side of the steep bank—another slip, and in the darkness five forms could be dimly discerned, each showing the others the

quickest way to leave a touring car. Verily, they stood not upon the order of their going—they jumped. Five feet further on, and—but what's the use? Fence poles, planks, chains, ropes, improvised block and tackle, stones, the united efforts of five men and the sixty horses under the hood finally conquered and once more the car was on the road, the motor still running steadily. Then, after a short run, the welcome lights of Buffalo shone upon the car and its load, greatly resembling a transcontinental flyer.

All thought of a return that night was given up, for flesh and blood were not equal to the task that the car was ready for; but early the next morning, while the light was still dim, five men in a muddy machine dodged milk wagons and newsboys out of Buffalo. With no eye for scenery, because the rain again hid it, the miles were once more counted off, with every one bringing home nearer. A few hours' run from Buffalo brought the party into the midst of a severe hail storm, but through it all the pelted party petulantly picked their pestered path. On the wrong road, set right by a kind country school ma'am, surrounded by a flock of wide-eyed children, back to the right highway, and on again plowed the car.

At Fredonia there was a stop for more oilskins and hats, and innumerable questions of the ever-present natives to answer. Weary of everlastingly telling them the horsepower, make, etc., the scribe of the party finally delivered a little lecture, informing them that the machine was "an English Fiat, of the same model as the winner of the 1908 Vanderbilt cup." And then came the expected: "Jes what I said when them fellers went through here yisterday—recernized that autymobeeel from pictures of that air racer he told about." A diversion, yes—but not enough of one to coax even a watery smile.

Beyond, in the open country, the sun suddenly broke through the drifting clouds. Hats were pushed back, rubber coats loosened, and the camera man ceased guarding his machine in the way a hen broods over her eggs. Even the despondent mechanic ceased his caustic comments on the practice of trying out a car in the gulf stream, and predicted that the party would go clear through to Cleveland without another stop. And then, just as everyone began to feel the same way—another sharp puncture. But who minded a little thing like that? Warm sunshine and brightness—what of a muddy road? And then, just as the jack was put under the spring, came a rumble, a flash, and once more the heavens began their sad tale. Spirits and clothes dampened, the next chapter of the run was taken up. West of Erie were found better roads.

Late in the afternoon, the blessed brick

pavement leading into Cleveland was encountered, and the party thankfully drew into the city. Even the rain did not feel as wet, now that it was home rain. The Stearns was a perfect imitation of a clay model of a motor car. Even the red leather, wherever there was an exposed spot, was gray with the conglomerate mud of three great states—Ohio, Pennsylvania and New York. But the motor, and, in fact, every part of the car, was working perfectly, and had acted that way throughout, so the trip was declared a success, and it was, for an average speed—actual running time—of over 25 miles per hour had been steadily maintained through the rain and mud. Yes, the run was a perfect success—from a mechanical standpoint. From a flesh and blood standpoint—but that's another story, as Kipling says.

CHICAGO MERGER PROPOSED

Chicago, Oct. 25.—Directors of the Chicago Motor Club last night received a proposition from the Chicago Automobile Club to consolidate with that veteran organization. The directors considered it too important a matter to decide themselves so a special general meeting has been called for November 12, at which time the motor club members will be called upon to pass upon the proposition. The Chicago Automobile Club promises the motor club representation on the board of directors, places on all important committees and admits frankly that it would be glad to avail itself of the services of some of the active members of the motor club who have promoted and successfully run off a reliability run, a hill-climb and two economy tests and who now are organizing the Chicago show 600-mile reliability run. The Chicago Motor Club is a little over a year old and has a membership of 140 as compared with the 500 of the Chicago Automobile Club.

BAN ON BIG TEST

Berlin, Oct. 19—Owing to the action of the authorities in the province of Saxony in forbidding the holding of the west and south German tours, the heavy wagon competition of the Imperial Automobile Club and the Association of German Automobile Manufacturers, planned for October 7-12, has been abandoned. The route via Magdebourg, Dessau and Jüterbog, lay for a great part in Saxony, so the government had to comply with the request of the authorities in forbidding the contest. The conditions were such that it is difficult to see that the public safety was endangered. A maximum distance of 180 kilometers in 13 hours for light wagons and of 70 to 80 kilometers for heavy wagons during the same period can hardly be termed excessive. The Imperial Automobile Club is working out a new route which will eliminate Saxony. This new route is to be laid before the government officials for sanction.

WORKS ON RIGHT LINES

Connecticut Highway Commission Tackles Roads Problem in a Systematic Manner

Hartford, Conn., Oct. 25.—The Connecticut state highway commission has a habit of going after things in the right way and in conversation with a representative of Motor Age, Highway Commissioner James H. MacDonald outlined a few of his plans for the ensuing year. As already noted in Motor Age, 134 towns have accepted state aid and the commissioner is anxious that each and every town should come in under the appropriation and he therefore extended the time limit for applications for the especial benefit of these delinquents.

One thing which makes the work of the commission more difficult is the change of town officers from year to year, so the same faction is not always in power, or in other words the change of officials may mean a change of policy so far as the betterment of roads is concerned. The commissioner has sent to the selectmen of every town in the state a circular letter requesting that a complete report of roads, construction and general condition be made on blanks provided for the purpose for every year since 1895 when the office was first established. The commissioner deferred sending out these letters and inquiry blanks until after the state election so that attention of the officials of the numerous towns is imperative. When these replies are in the commissioner's office the information will be complete and must in each case be the result of personal investigation.

The commissioner is a busy man and has reduced office affairs to a science. He will not, for instance, permit a town to go to the expense of buying road material when there is anything of that nature within the borders of that same town nor can outside help be employed if there is sufficient at home. As an illustration of the way the commission does things, one route from New Britain to Hartford is 13 miles and is extensively traveled. Now the commissioner is having a survey made of a straighter route 8 miles in length, a saving of 5 miles of travel, a cost of \$50,000 and the eliminating of concentration of wear which the commissioner states is in all cases to be avoided. He therefore has provided, or will very soon, two roads leading to Hartford, both of them good ones. Another route under way reduces distance of travel about one-half.

The commissioner is of the opinion that motor cars have a damaging effect upon the highways but hopes to ultimately secure some constructive material that will avoid excessive wear and tear now apparent. Another plan is to eliminate all state grade crossings, some of which

are man-killers, in several instances being completely hidden until one is almost upon them. The commission has in service a corps of accomplished engineers which renders every assistance to towns contemplating improvements. The highway commission has been in existence 12 years during which time wonderful improvements have been made. In his letter Commissioner MacDonald says:

"It may not be possible for me to do anything in the way of extended repairs this fall, except in extreme cases where there is great danger to the traveling public, or the entire destruction of the road is threatened. But the reports from the several towns will materially assist me in getting ready for the spring repairs and will furnish me with knowledge of all roads needing immediate attention, so that I may act promptly in the spring."

NUTMEGERS WANT RACE

Hartford, Conn., Oct. 25.—A strenuous effort is being made by Connecticut motorists to secure for that state the proposed stock car race for next spring. That such a contest should be held within the borders of the old Nutmeg state is much to be desired. If the plum is secured the committee of arrangements will see to it that the roads are put in shape and well oiled. This would mean an expenditure of about \$5,000 for a 30-mile course. As the roads of the state are for the most part good there is small reason why the contest should not be held here. Quite naturally, of course, the handful of conservatives would put up a wail against setting aside the roads of the state for a race, but then it can hardly be denied that the moral effect upon Connecticut's motor car industry in consequence of such a race is well worth consideration. Hartford county would like the event but it would no doubt be far better to run it along the main route, that is to say, over the main road from New York to Boston.

LAW NOT CONFLICTING

Beloit, Wis., Oct. 26—According to the verdict of a jury in the municipal court, the Wisconsin law concerning speed limits and providing punishments for violations was not bungled by the Wisconsin legislature, and means just what it says. W. F. Barnes, of Rockford, Ill., who was arrested for speeding in Beloit, put up the defense that the law was conflicting because the word "and" was inserted instead of "or." He questioned the validity of the section which says: "Any person who shall violate the provisions of sections 1, 3, 5 and 6 shall be punished." The warrant for Mr. Barnes' arrest charged violation of section 3 of the law. He claimed that he was not charged with violating sections 1, 3, 5 and 6, and consequently should be set free. The jury, after hearing a special opinion from the attorney general of Wisconsin that the defense was but a quibble, returned a verdict of guilty in 3 minutes.

COMPETITIONS OF 1907 AT HOME AND ABROAD

CERTAINLY the motoring world, at home and abroad, cannot complain of a dearth of competitions of a nature best designed to bring to the attention of the buying public the practicability of the modern motor car. While the United States has had no Vanderbilt cup race to key up the interest, still there have been innumerable reliability runs, economy tests, hill-climbs, track meets and a Glidden tour that excelled any of its predecessors, not overlooking the fact that a sensational cut was made in the Chicago-New York record, a blue ribbon mark that is highly coveted. Abroad there also has been singular activity in the way of road races and big tours, with a new world's 24-hour record to cap the climax.

The season in this country can be said to have opened with the meet at Ormond in January, but to the disappointment of the world at large no records were broken, the most sensational incident connected with the sand meet being the accident that nearly resulted in the death of Frank Marriott in the Stanley steamer. Eight events in all were run. A Stanley steamer won the 5-mile flying start in 3 minutes 44 seconds; an American Mercedes the 5-mile standing start in 4 minutes 25 seconds; a Stanley steamer the flying mile for American touring cars in 53 2-5 seconds; a Stanley steamer a 5-mile race in 3 minutes 51 4-5 seconds; a Rolls-Royce the 20-mile international championship in 23 minutes 5 seconds; a Mercedes the 100-mile race for the Minneapolis trophy in 1 hour 26 minutes; a Mercedes the 10-mile handicap in 13 minutes 59 seconds, and a Wayne a 5-mile touring car race.

The Glidden tour, which started in Cleveland, went to Chicago, then out across country to New York, was the greatest ever promoted by the American Automobile Association. There were eighty-two entries, of which number seventy-four started. Forty-seven of these were Gliddenites, fourteen were after the Hower trophy and sixteen were non-contestants—that is, they were on the tour trying for Glidden certificates, not being affiliated with any of the clubs. In this year's tour there was a radical change in the manner of deciding the contest. Instead of an individual competition the A. A. A. made it a club team affair, the trophy going to the club whose team made the best showing. Nine teams were in this and it was a neck and neck affair between the Buffalo and Pittsburg club, the former winning. The Hower trophy was put up for competition among the roadsters and this, too, resulted in an interesting fight, the White steamer and the Stoddard-Dayton going through with perfect scores, which resulted in there being a run-off of the tie, a route west from New York city being chosen and the Stoddard-Dayton being the loser, being

Napier Establishes Wonderful 24-Hour Record—Glidden Tour Statistics—Other Motor Data

penalized the third day for failure to reach Buffalo on time. This gave the trophy to the White. In the club competition the final standing was as follows: Automobile Club of Buffalo, first, 981 4-5 points; Pittsburg Automobile Club, second, 977 1/2; New York Motor Club, third, 683 4-110; Westchester Automobile Club, fifth, 620 1/4; Automobile Club of America, sixth, 498 1/2; Cleveland Automobile Club, seventh, 483 5-9; Chicago Automobile Club, eighth, 240 1-7; Detroit Automobile Club, ninth, no points. The cars making perfect scores in the Glidden cup run were: R. D. Garden, Pierce-Arrow, New York; G. S. Salzman, Thomas, Buffalo; Montgomery Hallowell, Thomas, Buffalo; P. S. Flinn, Pierce-Arrow, Pittsburg; F. S. Dey, Pierce-Arrow, Buffalo; G. A. Weidely, Premier, A. C. A.; H. H. Perkins, Packard, Pittsburg; A. Kumpf, Pierce-Arrow, Buffalo; G. P. Moore, Welch, Pittsburg; E. S. Lea, Walter, New York; R. M. Owen, Reo, A. C. A.; A. N. Jervis, Berliet, New York; R. H. Tucker, Royal Tourist, Cleveland; Walter C. White, White, Cleveland; A. J. Scaife, White, New York; C. H. Burman, Peerless, Cleveland; W. C. Straub, Peerless, Cleveland; Edward Noble, Haynes, Chicago.

American Reliability Runs

The Automobile Club of America instituted a novelty in the way of a sealed bonnet reliability test—a 4-day affair in which forty-seven cars started and in which forty-one went through with perfect scores. It was considered a remarkable demonstration of the worth of the motor car and silver cups were awarded to each of the forty-one clean-score cars.

In the way of a reliability run the Chicago Motor Club promoted an affair which was a combination sealed bonnet-non-motor stop contest in which two routes were used. The big cars had to cover 175 miles by way of Waukegan, McHenry, Elgin and Aurora, while the others cut home from Elgin, making their journey 145 miles in length. This affair attracted ninety-five entries of which eighty-eight started, seventy-five finished and fifty-five had perfect scores.

Late in May the New York Motor Club promoted a 208-mile reliability run from New York to Albany by a circuitous route. The weather was particularly stormy, the result being that none of the cars could make their schedule on time, resulting in time penalizations for everyone. The Corbin, though, had the fewest points against it—nine—and consequently was regarded as the winner, although the committee reported the following as having made the

run without mechanical trouble of any sort: Corbin, Lozier, Haynes, Stoddard-Dayton, Berliet, Pope-Hartford, Continental and Frayer-Miller. At about the same time the Long Island Automobile Club held a 2-day reliability and the New Jersey Automobile and Motor Club a 3-day affair. In the former ten cars tied with perfect scores—the Cadillac and Maxwell in class A, the Columbia, Oldsmobile and Pope-Hartford in class B, and the Pierce-Arrow, Packard, Pope-Toledo, Winton and Matheson in class C. An attempt was made to run off the tie, but only two were eliminated—the Oldsmobile and the Pope-Toledo. In the New Jersey run, which covered 415 miles, thirteen had perfect scores—the Matheson, Stoddard-Dayton, Oldsmobile, Grout, National, Knox, Winton and Autocar in the touring car class and the Stoddard-Dayton, Corbin, Buick, Jackson and Dragon in the roadster division.

The 2-day endurance run of the Quaker City Motor Club of Philadelphia in January was a strenuous affair which returned F. W. Aurig's Stevens-Duryea the winner in class A and W. G. Brooks' Autocar in class B. In this same territory in May the Motor Club of Harrisburg had a 2-day test in which thirty-two cars started, the Pullman, Thomas, Pierce-Arrow and White having perfect scores in class A and the Stoddard-Dayton in class B, the roadster division. Cleveland held a 3-day test in September that was remarkable for the adverse weather conditions encountered. Only eight cars started and only one went through with a perfect score—the Gaeth, a Cleveland product.

Of the thirty-five finishers in the 207-mile reliability run of the Bay State Automobile Association out of Boston twenty-two had perfect scores—the Oldsmobile, Peerless, Shawmut, Craig-Toledo and Corbin in the roadster class and two Ramblers, two Knox cars and one each of the Winton, Pope-Hartford, Columbia, Peerless, Marmon, Berliet, Cadillac, Grout, Stoddard-Dayton, Studebaker, Lozier and Elmore in the touring car division. Forty-three took part in the reliability run from Philadelphia to Wildwood, N. J., the winner being J. P. Buchanan's Stoddard-Dayton.

Milwaukee's reliability, following closely on the heels of Chicago, attracted twenty-four starters, of which fifteen had perfect scores, as follows: Three Buicks, three Ramblers and one each of the Wayne, Peerless, Kisselkar, Stoddard-Dayton, Mason, Pope-Hartford, Premier, Winton and Reo.

Two reliability runs for owners only were held—one in Detroit in which eight had perfect scores and the other in St. Louis in which sixteen went clean. In both these affairs tradesmen were barred. At Detroit two Packards, two Welches, a

Wayne, Pungs-Finch, Mitchell and Cadillac were perfect and in St. Louis there were two Packards, two Whites, two Thomases, two Stoddard-Daytons, a Ford, Marmon, Corbin, Dragon, Bates, Buick and Pope-Toledo.

Economy Tests and Climbs

Chicago seems to have been the only city to attempt an economy run of any magnitude. The Chicago Motor Club held two, the second one really being the final of the first. Twenty-four started in the run to Valparaiso and return, 95 miles, and twenty-three finished, the winner being Henry Paulman's little Pierce-Arrow, which made the distance on 4 gallons 2 quarts 11 ounces. The ten cars making the best showing in this qualified for the Silent Knight trophy, a test to New Carlisle, Ind., and return. This made eligible two Berliets, two Pierce-Arrows, a Silent Knight, Corbin, Apperson, Locomobile, Diamond T, and a Haynes. One of the Pierces did not start and the winner was Henry Paulman's 45-horsepower Pierce-Arrow, which made the 196 miles on 12 gallons 15 3-5 ounces.

Wilkes-Barre, Pa., held the largest hill-climb of the year, while other events of this nature were promoted in Chicago, Cleveland, Minneapolis, Milwaukee, New York, Hartford and other places. At Wilkes-Barre the White steamer, barred from competition, made the fastest time—1 minute 49 4-5 seconds, up Giant Despair. A protest followed from Walter C. White, because of the steamers being barred which resulted in two of the events for which the White was considered eligible being given to the steamer people. On the day of the climb, however, the firsts were parceled out as follows: Stearns, two; Stanley, Maxwell, Corbin, Pope-Hartford, Great Chadwick six, and Matheson. The last-named car won the free-for-all. The Chicago Motor Club's double climb at Algonquin, Ill., resulted as follows: Class 1, Autocar; class 2, Buick; class 3, Columbia; class 4, Moon; class 5, Pierce-Arrow; class 6, Stearns and Apperson tied. At Milwaukee the Peerless won two firsts, including the free-for-all, while the other winners were the Ford, Jackson, Maxwell, Buick, Pope-Hartford, Rambler and Jackson.

Cleveland's pretentious affair gave three firsts to the Stearns and the same number to the Ford and Jackson. The White steamer won twice and the Reo, Stoddard-Dayton and Darracq also scored. A climb up Fort George hill in New York city gave the Stearns three victories and one each to the Stevens-Duryea and Pope-Hartford. The Minneapolis hill-climb saw the honors well divided among the Jackson, Ford, Mitchell, Pope, Packard, Stanley and Stevens-Duryea. Hartford winners were the Maxwell, Jackson, Knox, Pope-Hartford, Corbin, Thomas, Stevens-Duryea, Pope-Hartford and Ford. The Corbin won twice, as did the Stevens. Events of a similar nature were held in

other sections of the country, California being particularly active in this respect. Most of them, though, were run on a straight time basis.

Philadelphia started the 24-hour race craze and ten of them were run before the season wound up. A new scheme was sprung in the way of a team event in which there were two cars and two drivers to a team. Five of the ten races were run this way, but they did not prove as popular as the single-car race. As a result there are several new sorts of records on the books, the Locomobile being credited with the best team race performance, 1,146 miles. In giving the Renault the single-car mark of 1,079 miles most authorities seem to overlook the fact that 2 years ago the National put up 1,094 miles in competition of this sort, a mark which never has been excelled except in the case of S. F. Edge and the Napier in England. This last, however, was an attack on time and not a competition performance as was the National's. The 24-hour races of the year were as follows:

Place	Winner	Mileage
Philadelphia.....	Autocar.....	837
Detroit.....	Ford six.....	1,135
Minneapolis.....	Locomobile.....	1,037
St. Louis.....	Jackson.....	833
Chicago.....	Thomas.....	846
Brighton Beach.....	Thomas.....	997
Morris Park.....	Renault.....	1,079
Philadelphia.....	Lozier.....	717
Milwaukee.....	Locomobile.....	1,146
Morris Park.....	Fiat.....	984
*Team races.....		

Mile Track Record Beaten

In addition to these there were other events of more than passing interest. The track work resulted in the mile record twice being lowered. The first time Walter Christie in his front driver cut Oldfield's 53 seconds to 52 seconds at Minneapolis, only to lose it a while later to Louis Strang, his own mechanic, who took the Christie car to Birmingham, Ala., while Christie was recovering from the effects of his fall at Pittsburgh, and placed the record at 51 3-5 seconds.

Another notable achievement was the cracking of the Chicago-New York record by the Franklin four-cylinder runabout, manned by Carris, Bates, Talbot and Daley, who traveled the 1,050 miles between the two cities in 39 hours 53 minutes, cutting the old record of 56 hours 58 minutes which was made the year before by a Franklin six-cylinder. Only one attempt was made on the transcontinental record, a Dragon starting but being stopped at Omaha on the way east.

European Competitions

On the other side of the Atlantic there were competitions of all sorts—road races, hill-climbs and the like. The leading stunt was the creation of a wonderful 24-hour record on the Brooklands track, 3¼ miles in circumference, and which had just been put into commission. S. F. Edge, driving a six-cylinder Napier and accompanied by two other Napier sixes as pacemakers, did 1,581 miles 1,310 yards, an average of 65.9 miles an hour for the journey twice around the clock. One of

the other cars did 1,538 miles and its mate 1,521 miles. Another startling event was a race from Pekin to Paris, roughly 8,000 miles, which was won by Prince Scipion Borghese in a 40-horsepower Itala. Three times was the London-Monte Carlo record beaten, the holder of the mark now being A. G. Brown, who drove a 45-horsepower four-cylinder Mercedes, and did the distance in 29 hours 10 minutes. H. R. Pope holds the Monte Carlo-London mark at 29 hours 16 minutes, made in a 40-horsepower Itala. The Paris-Nice record was set at 16 hours 15 minutes by Sorel in a 60-horsepower de Dietrich.

Road racing started with the voiturette cup race in Sicily which was won by Naudin in a Sizaire-Naudin, who did 186 miles at an average of 21.7 miles per hour. The Targa Florio, also in Sicily, was won by Nazzaro in a Fiat, who averaged 33.7 miles per hour for 279 miles. The Tourist trophy race in England was won by E. Courtis in a 20-horsepower Rover. The Tourist trophy heavy car race was won by G. P. Mills in a 30-horsepower Beeston-Humber, while the Graphic trophy hill-climb at the same time was taken by J. E. Hutton in a 60-horsepower Berliet. The Moscow-St. Petersburg race was captured by Duray in a 70-horsepower de Dietrich. Nazzaro in a Fiat won the kaiserpreis race in Germany, while the French grand prix returned Nazzaro in a Fiat as a winner, his third big victory of the year. Nazzaro averaged 70.5 miles an hour. The sportive commission cup, run at the same time, went to De Langhe in a Darracq. The Ardennes was run under two sets of rules, Brabazon in a Minerva winning the kaiserpreis event and De Caters in a Mercedes the grand prix. The Liederkerke cup was captured by Berliet in a Minerva. The Press cup was won by Renaux in a Peugeot. The Brescia circuit saw two events, one for the Florio cup, won by Minoia in an Isotta Fraschini, averaging 53¼ miles per hour for 243¼ miles, and the coupe de vitesse by Cagno in an Itala, who did 65.25 miles an hour.

The Herkomer was the largest European tour and it was won by Erle in a Benz, with Axhoff in a Metallurgique second and Opel in an Opel third. The Crystal Palace flexibility test was taken by a 60-horsepower Napier six, while in the Irish reliability the winners were: Talbot, Humber, Ford, Chambers, Daimler, Hotchkiss, Swift and Unic. In the Scottish reliability the Swift, Mass, Belsize, Humber, Ariel-Simplex, Iris, Rolls-Royce and Arrol-Johnston gained distinction. The White and Stanley steamer won in their respective classes in the dust trials at Brooklands. In the way of non-motor stop runs a six-cylinder Rolls-Royce went 15,000 miles under Royal Automobile Club supervision with only one involuntary stop—one at 629 miles, made to turn on a gasoline tap. A six-cylinder Hotchkiss completed 15,000 miles, 10,474 of the miles being without an involuntary stop.



AMONG THE MAKERS AND DEALERS



Finally Goes Under—The Bay State Auto Co., of Boston, the concern which was erroneously recorded as having failed a few weeks ago, has finally gone under. An assignment was made October 19 to James J. Irwin.

Goes to Kenosha—V. A. Nielsen, formerly manager of the Moon branch in Boston, has gone to Kenosha, Wis., to accept a position in the Rambler factory. Nielson formerly worked for the Boston branch of the Rambler.

Draw for Space—The Automobile Dealers' Association of Pittsburg met October 17 to draw spaces in the show which will be held in Duquesne garden April 4-11, 1908. The Belden Motor Car Co. was admitted as the only new member. The association is thriving.

Dickson Retained—J. B. Dickson, who has for some years been connected with the Quaker City Automobile Co., former Philadelphia representative of the Pope-Toledo car, soon will assume charge of the establishment which is to be set up on gasoline row by the new agent, the Charles F. Johnson Automobile Co.

Panhard Prices Changed—Following the lead of the importers of the Fiat and Hotchkiss Mr. Massenat, of the Panhard & Levassor branch, in big ads in the daily papers, announces new prices for the Panhard. The figures are not given, however, those interested being invited to call at the branch for particulars. There are rumors afloat of other cuts in the prices of foreign cars.

Journalist in the Trade—Stuart Gayness, for some years motor editor of the San Francisco Examiner, has quit newspaper work to become sales manager of the City Motor Car Co., agent of the Stearns in that section. The head of the company, Dr. J. C. Snead, early decided to take an active part in every endurance run and race meet that he could enter, and he has maintained that policy. Every club and dealers' meet and run has found the Stearns present, and the car also has been put through a number of sensational hill-climbing feats.

Berliet Trip Is Over—After touring through eleven different states and covering a distance of 5,000 miles, the Berliet has arrived in New York. The big six originally started from the factory of the American Locomotive Automobile Co., at Providence, R. I., and after visiting Boston went direct to New York. After a brief stay in New York the car and party of five, among whom were F. M. Hoblitt, Arthur N. Jervis and H. C. Townsend, left for a western trip, the principal point being Chicago. The party then headed for St. Louis. Leaving St. Louis, the tourists crossed the state of

Illinois to Terre Haute, Indianapolis, Ind., Dayton, Columbus and Cleveland. Then the run was made to Pittsburg, then to Philadelphia and New York.

Fosdick's Line—The Harry Fosdick Co., of Boston, now managed by the Robbins brothers, have secured the agency for the Springfield and Atlas cars, both of which are manufactured at Springfield, and also the Baker electric. The concern formerly handled the Thomas and Fiat cars.

Will Handle Studebakers—The sale of Studebakers in the entire territory east of the Alleghany mountains has been placed in the hands of the Studebaker Brothers Co. of New York. This increase in the territory covered by the New York house has necessitated a larger sales staff and C. F. Redden, who has an extensive acquaintance among the trade, has been made manager of the motor car department in New York.

Gilmore Back in Boston—E. A. Gilmore has returned to Boston to again go into business, this time on his own account. He formerly was manager of the Rambler branch in Boston but left it to go to New York to accept a position with the White company. Now he has decided to return to Boston, where he has formed a partnership with Charles E. Whitten, the new concern to handle the Thomas line. Whitten formerly handled the Thomas and Rambler cars in Lynn.

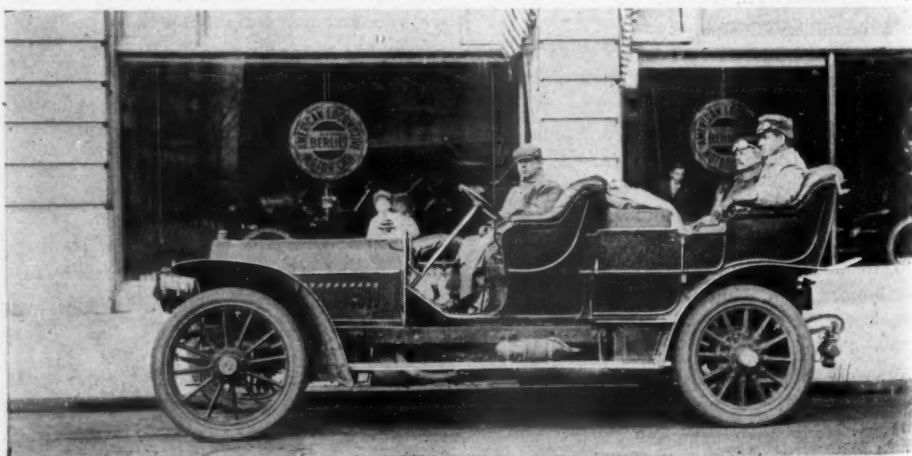
Knox Water-Cooler—The Knox Automobile Co., of Springfield, Mass., hitherto an advocate of air-cooling, announces that in addition to a line of air-coolers it also will make for 1908 a water-cooler. It will be a 30-horsepower five-passenger car with four 4½ by 4¼-inch cylinders, the valves located in the head and separately water-jacketed and operated by rocker arms and tappet rods. The clutch is a metal-to-metal cone with cork inserts and the gear bevel drive with one joint. A cellular radiator with fan, gear pump and

separate water jackets for head and cylinder form the cooling system. The wheel base is 102 inches.

Jones in Paris—The Jones Speedometer Co. has established a branch house in Paris at 88 Boulevard de Courcelles. A complete line of instruments and parts will be carried. Jones instruments for foreign use carry dials indicating kilometers instead of miles. Rudolph Simonetta, general manager for Jones' foreign interests, is in charge of the new branch.

Johnson Opens in Toledo—Charles F. Johnson, of Cleveland, recently opened a garage in the building lately vacated by the Craig-Toledo people, on Madison avenue, Toledo. It is styled the Toledo garage, and is agent there for the White steamer. S. C. Fisk, until recently connected with the Pope company in Toledo, is in charge of the local institution. Mr. Johnson, who also owns a garage at Cleveland, is in Philadelphia, where he is arranging to put in a third. He already has offices in New York, Chicago and Toronto, and plans on extending his operations to other large cities in the near future. Other lines of cars will probably be put in.

Builds an Auto-Cycle—James M. Vandegrift has just completed at the factory of the Brennan Motor Mfg. Co., at Syracuse, an auto-cycle which has a water-cooled motor of 20 horsepower and which will do 55 miles an hour, it is said. Mr. Vandegrift some time ago constructed for the Vandegrift Automobile Co., of Philadelphia, an electric auto-cycle and two 6-horsepower gasoline auto-cycles for experimental purposes. The larger machine constructed at Syracuse is of the same general type. The car has a large wheel in the center of the rear and front and has two small wheels on the side. It is claimed that the car has the utility of a motor car and the economy of a bicycle. Upon completion the car will be shipped to New York for demonstration purposes.



FINISH IN NEW YORK OF BERLIET AFTER 5,000-MILE TRIP



FROM THE FOUR WINDS



Now a C. M. C. Director—Joseph V. Lawrence has been elected a director of the Chicago Motor Club to fill the vacancy caused by the resignation of F. C. Riggs, who has removed to Detroit.

Clever Idea—Driving rain or falling snow makes difficult motor car driving behind a glass wind shield, but a Chicago chauffeur has just invented a roller squeegee which cleans off the glass pane when a cord is pulled. It is fitted to a Columbia limousine owned in Chicago and is said to work perfectly.

Gymkhana Victories—Walter Schmunk, of the Boston branch of the White steamer, was the star at the recent gymkhana meet of the Bay State A. A. where he won four of the seven events. In a year Manager John L. Snow, of the Peerless company in Boston, has won three brake test competitions in New England, each time making a new record for stopping his car short. In the recent Bay State games he brought his Peerless car to a stop almost within its own length while going at a good clip.

Organize for Good Roads—The permanent organization of the road improvement association of four counties of Maryland has been effected, the name decided upon being the Good Roads League of Frederick, Carroll, Howard and Montgomery Counties. The league will co-operate with the Maryland Automobile Association in efforts to have better roads in the four counties named. A majority of the members of the league, who are wealthy farmers and business men of their respective communities, are owners of motor cars. They also will make an effort, together with the Maryland Automobile Association and the various motor clubs throughout the state, for less stringent laws. The officers of the league are: Jesse P. King, president; William A. Walker, secretary; W. Frank Burdett, treasurer; vice presidents, W. L. Day, for Frederick

county; Charles Nicholson, Howard county, and Samuel R. Molesworth, for Montgomery county. These officers, together with Dr. R. Claude Fout, Dr. W. E. Gaver, S. T. Mullinix and James M. Mount, compose the board of directors.

Hunters Use Cars—Several Hartford hunting parties are making extensive use of motor cars to reach the scenes of their sport. George H. Risley is using a car in Maine, H. R. Coffin is using a high-powered machine in the woods of northern Massachusetts and Dr. R. W. Alcott is using a car in Maine. In the state proper the season is not far enough advanced to insure any degree of sport.

Hoosiers Are Slow—Indianapolis, Ind., is talking of one of the largest and best indoor motor car exhibitions that has ever been given in the city if—. The whole thing hinges on the if, for while there is plenty of talk of a show no one among the dealers has been found with sufficient courage to start a movement for organizing and planning the show. With one of the largest pavilions in the country, Indiana as the center for some of the largest factories in the world and almost every American-made car of prominence represented in the state, it is believed that an elaborate show could be given.

A. M. L. Railroad Rates—The American Motor League sends notice to motorists that reduced rates of fare to New York during show weeks are given to league members only, and that only those whose names were on the membership roll on or before October 25 will receive this benefit. Each member must hold a card order, which will be sent by the secretary on request to members whose dues are paid and to new members whose names are enrolled at once. Names and addresses can be wired to league headquarters and annual dues, \$2, sent by mail at once. Names are entered by the secretary as fast as received. Tickets for New York

on the card order system were sold on October 25, 26 and 27 and members may return from New York on any day up to November 11 inclusive.

Blumenthal a Director—Ben Blumenthal, of the West End Auto Palace, at the last meeting of the board of directors of the New York Automobile Trade Association was elected a director to succeed Carlton R. Mabley. The Mitchell Motor Co. has made application for membership in the association.

Philadelphia Show Plans—Following the precedent established by the management of the garden show, the Philadelphia Automobile Trade Association show promoters will set apart Tuesday and Thursday, November 12 and 14, as buyers' nights, when, in order to keep down the crowd in the much-too-small First regiment armory building, the admission fee will be raised to \$1. It also has been decided, in view of the numerous demands for space, to devote the main floor, with the company rooms thereon, to complete motor car exhibits, relegating the sundries displays in their entirety to the second floor.

Outing for Franklin Girls—The accompanying photograph was taken at the annual outing of the stenographers of the H. H. Franklin Mfg. Co. held at Skaneateles last week. It has been the custom for the company each year to give the girls an outing. Twelve large touring cars carried the party by way of Genesee street, Syracuse over the State Road to the village of Skaneateles. In the party were forty-eight young women, Mr. and Mrs. Barton, Mr. and Mrs. H. B. Webb, who acted as chaperons, and fourteen chauffeurs. After dinner was served, Mr. Webb read a paper giving a brief horoscope of the life of each girl.

One Airship a Fizzle—The British airship Nulli Secundus has had an inglorious termination to its first public appearance. Recently it was driven from Aldershot to London, where it circled round St. Paul's, with a kink or two that looked like disaster, and after hovering over the city for awhile was quite unable to return to Aldershot against the 15 miles an hour breeze. It was therefore taken to the Crystal palace and anchored there inside the cycle track grounds. It was to have made its return next day, but a gale arose and in order to save the affair from wreck it had to be scuttled and dismembered. It has been written as if Nulli Secundus did a marvelous performance, but it was nothing out of the ordinary, experts say, and its control was by no means reassuring. That this is about the fact is shown from the announcement that a new airship will replace Nulli Secundus.



FRANKLIN STENOGRAPHERS ON TRIP TO SKANEATELES



THE READERS' CLEARING HOUSE



ANSWERS F. B. STEARNS

Chicago—Editor Motor Age—Motor Age publishes a long article by F. B. Stearns in which he calls the six-cylinder proposition a passing craze. Mr. Stearns closes his article by saying that the Stearns company will continue to build a few six-cylinder cars, but in the main it will largely favor the time-proven reliable four-cylinder, adding that the four-cylinder motor is as good as any six. We suppose that an old fogey, who sticks to his time-proven reliable ideas is trailing along on a basis very satisfactory to himself, but he hardly would be called a good business man in this progressive period. It seems curious that when the Stearns car is called upon to do anything out of the ordinary the company is always careful to use a six-cylinder machine. While it is admitted many of the manufacturers are building them against their will, this may be from the fact that they have to use up the four-cylinder parts which they have on hand, and not because they think a six-cylinder is not a good proposition. In answer to the claim Mr. Stearns makes, that a six-cylinder car is being pushed by some manufacturers whose four-cylinder motors were a failure, I respectfully refer him to the well known high quality of the Stevens-Duryea four-cylinder engine. No engine ever turned out in this country or any other ever ran smoother or quieter or had more power for the bore and stroke or stood up better, so this reason would scarcely have reference to the Stevens-Duryea. The writer saw a six-cylinder Stearns recently perform on the track in Chicago, and the car ran smoother and faster than any four-cylinder car Mr. Stearns ever turned out. It far outclassed any four-cylinder car shown on the track, and its beautiful running qualities were passed upon by many in the audience. The statement that sixes cost more to maintain is scarcely plausible. In the first place, on account of the perfect balance of the engine, there is less strain on the crankshaft and the bearings, and on correspondingly every other part of the machine. Mr. Stearns' statement that a six has 50 per cent more weight than a four-cylinder car is not so; neither does it require 50 per cent more care, take 50 per cent more repair bills and 50 per cent more parts, simply because two cylinders, a slightly longer crank case, crankshaft and camshaft do not constitute 50 per cent of the entire car. The fact that there never has been a broken crankshaft in the six-cylinder Stevens-Duryea is ample proof that there is less strain on any part of the engine. The torque of

the six-cylinder is necessarily very much evenner than any four-cylinder could be, because there are absolutely no points in the revolution of the crankshaft when no power is applied, such as happens at the four points in a four-cylinder car. Another alleged source of trouble is that Mr. Stearns thinks a chauffeur would be worried timing the valves of a six-cylinder motor; this shows he apparently has not the slightest idea of how it is done. It is only necessary to time the first valve and naturally all the others would be on time, whether there are six or sixty. The fact that almost invariably all racing machines have four-cylinder motors is true for two reasons, first, that probably the six-cylinder had not been developed by the manufacturers who made these racing machines, and secondly, the ordinary buyer scarcely wants a machine that tears along at a mile a minute, and as it is only a high rate of speed that a four-cylinder car shows its good points. In running slowly on the high speed the six-cylinder car so far outclasses the four-cylinder that the slightest demonstration will easily convince the most skeptical. As for hill-climbing, where constant power is necessary, the six-cylinder again demonstrates its vast superiority. The Stevens-Duryea six-cylinder cars have now been on the market for 3 years and they first came out in the face of the opposition of the entire trade. Simply by making good in every way the product of the Stevens company has built up a reputation and today its six-cylinder car is classed among the leaders in this country. The writer would like personally to give a demonstration to any one who chooses to call and ask for it. He thinks he can easily prove Mr. Stearns is mistaken in many of his contentions.—Louis Geyler.

STEAM VALVES AGAIN

Le Mars, Iowa—Editor Motor Age—I was not satisfied with the information given W. R. Harlan in answer to his questions about piston valves and I should have been glad to have given what insight my experience has proven, but to go into the details on this subject would be spoiling a lot of useful space, since such a small percentage of Motor Age readers are interested in anything that pertains to steam, to say nothing about a subject requiring a well trained mind to understand it. The last article of Mr. Harlan's in the October 12 issue shows plainly the well-posted, practical man the writer likes



to see in print, and easily sets aside the belief that he might be dwelling on theory alone or that he may have been a graduate from a correspondence school. "C. F. M." probably never had a chance to shovel coal into an engine with piston valves or one with a slide valve, both doing the same kind of work, and possibly never got any closer to riding on a locomotive than in the smoking car, or he would not make such statements. To take out the millions of well designed slide valves on all classes of engines would mean to put out of commission, perhaps, 75 to 80 per cent of the horsepower furnished by steam today. That a motor car fitted with piston valves may make a favorable showing in comparison with gas engines simply proves how good other parts of this system are; also the possibilities of steam, when even imperfectly handled. Most steam cars were put together by men who would make a fizzle of putting up a cider press or a feed cooker. The indicator card, the man at the throttle and the man with the scoop shovel are pretty good to tell what an engine is doing for power and economy, and a man can get none of these in a drawing room. Any crossroad repairman with an old file made into a scraper could in a short time reseat a slide valve that had done thousands of miles' service, while it would take a well equipped machine shop to do the same thing on a piston valve. This, with the ability to see how to set, simplicity, lack of variable travel wear, all go to prove the superiority of the slide valve.—C. L. von Berg.

SCORED CYLINDER

Chrisman, Ill.—Editor Motor Age—Please state if it is possible to repair a scored cylinder. The car is a two-cylinder Ford. One of the piston pins never was fastened and in time made a bad cut in cylinder wall. I have thought of having a copper plating cut and then solder in hard babbitt and scrape true. The piston and rings are not damaged and engine pulls well except at very low speed, when one cylinder is weak. I have no doubt that it would be proper to replace the cylinder but as it would be expensive on an old car and, being good other ways, I think it should be repaired.—J. W. Manghiner.

The only true way to remedy this trouble is to put in a new cylinder and new pistons. If the scoring is not too deep the cylinder might be bored out, but in this case the other cylinder would have to be re-bored also and new pistons and rings fitted to both. This would be even more expensive than to have an entire new cylinder.